

The Gazette



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## NOTICE

The undermentioned Gazettes of India Extraordinary were published upto the 7th December 1955:—

Issue No.	No. and date	Issued by	Subject
355	S. R. O. 3607, dated the 3rd December 1955.	Ministry of Finance (Revenue Division).	Amendment made in the notification No. 13. Customs, dated the 28th February, 1953.
356	S. R. O. 3608, dated the 7th December 1955.	Election Commission, India.	Disqualifications incurred by the candidate for bye-election to the House of the People from Basirhat Constituency.

Copies of the Gazettes Extraordinary mentioned above will be supplied on indent to the Manager of Publications, Civil Lines, Delhi. Indents should be submitted so as to reach the Manager within ten days of the date of issue of these Gazettes.

## PART II—Section 3

**Statutory Rules and Orders issued by the Ministries of the Government of India (other than the Ministry of Defence) and Central Authorities (other than the Chief Commissioners).**

## ELECTION COMMISSION, INDIA

*New Delhi, the 8th December 1955*

**S.R.O. 3655.**—It is hereby notified for general information that the disqualifications under clause (c) of section 7 and section 143 of the Representation of the People Act, 1951 (XLIII of 1951), incurred by the person whose name and address are given below, as notified under notification No. PP-P/3/55(1)BYE, dated the 1st December, 1955, have been removed by the Election Commission in

exercise of the powers conferred on it by the said clause and section 144 of the said Act respectively:—

Shri Rameshwar Dayal, Village Mondia Khera, P.O. Dongra Ahir, District and Tehsil Mohindergarh.

[No. PP-P/3/55(2)BYE.]

By Order,

P. S. SUBRAMANIAN, Secy.

### MINISTRY OF LAW

New Delhi, the 12th December 1955

**S.R.O. 3656.**—[Contracts/Am(2)].—In exercise of the powers conferred by clause (1) of article 299 of the Constitution, the President hereby directs that the following further amendment shall be made in the notification of the Government of India in the Ministry of Law No. S.R.O. 3442, dated the 2nd November, 1955, relating to the execution of contracts and assurances of property, namely:

In the said notification, in part X which relates to the Ministry of Food and Agriculture, under head E, in item (ii), after the words and brackets "*the Under Secretary (Sugar Imports)*", the words "*or the Chief Director of Sugar and Vanaspati or the Director of Sugar Accounts*" shall be inserted.

[No. F.25(4)/55-G.]

V. S. JETLEY, Dy. Secy.

### MINISTRY OF HOME AFFAIRS

New Delhi-2, the 7th December 1955

**S.R.O. 3657.**—In exercise of the powers conferred by section 10 of the Mangrol and Manavadar (Administration of Property) Act, 1949 (II of 1949), the Central Government hereby directs that the following further amendments shall be made in the Schedule to the said Act, namely:—

In part I of the said Schedule under the heading:

#### 1. (A) Investment of Mangrol State

(i) Against item No. 13 relating to the shares of the Scindia Steam Navigation Company Limited in column 3 for the distinctive numbers "1009529/978", the distinctive numbers "1009529/728" and "1009779/978" shall be substituted and for the distinctive numbers "482442/447", "94449/458" and "1250683/687", the distinctive numbers "482442/449", "97449/458" and "1258683/687" respectively shall be substituted.

(ii) Against item No. 19 relating to the shares of the Central Bank of India Limited:—

(a) in column 3 for the distinctive numbers "481866", "609861/95" and "405316/65", the distinctive numbers "481866/870", "609861/75" and "405316/405345" respectively shall be substituted; and

(b) the distinctive numbers "407341/407365" shall be inserted at the end.

(iii) Against item No. 28 relating to the shares of the Indian Iron and Steel Company Limited in column 3 for the distinctive numbers "585637/736" the distinctive numbers "685637/685736" shall be substituted.

#### (B) Investment of Mangrol State for Islamia Charitable Education Trust Fund:

(i) Against item No. 6 relating to the shares of the Central Bank of India Limited in column No. 3 for the distinctive numbers "103670/616", the distinctive numbers "103607/616", shall be substituted.

(ii) Against item No. 14 relating to the shares of the Tata Iron and Steel Company Limited in column No. 4 for the figure "67", the figure "61" shall be substituted.

#### (C) Investment of Mangrol State for Wakf Trust Fund:

(i) Against item No. 20 relating to the shares of the Bank of India Limited in column 3 for the distinctive number "13361", the distinctive number "133361" shall be substituted.

(ii) Against item No. 22 relating to the shares of the Century Spinning and Manufacturing Company Limited in column 3 for the distinctive number "12978", the distinctive number "14978" shall be substituted.

(iii) Against item No. 43 relating to the shares of the Panch Valley Coal Company in column No. 6 for the name "S. M. Jehangirmian" the names "S. M. Jehangirmian and S. Abdulkhalik" shall be substituted.

(iv) Against item No. 45 relating to the shares of the Bank of Baroda Limited in column No. 3 for the distinctive number "1777", the distinctive number "19777" shall be substituted.

(D) *Investment made by Sheikh Jehangirmian:*

(i) Against item No. 24 relating to the shares of the Indian Iron and Steel Company Limited in column 6 for the name "S. Abdulkhalik", the names "S. M. Jehangirmian and S. Abdulkhalik" shall be substituted.

(ii) Against item No. 86 relating to the shares of the Tata Iron and Steel Company Limited:

(a) in column 3 for the distinctive numbers "226228/32" the distinctive numbers "266228/32" shall be substituted; and

(b) in column 6 for names "S. M. Jehangirmian Mahomed Badruddin and S. Abdulkhalik", the names "S. M. Jehangirmian and S. Abdulkhalik" shall be substituted.

(iii) Against item No. 87 relating to the shares of the Bombay Electric Supply and Tramway Company Limited in column 3 for the distinctive numbers "46206/10", the distinctive numbers "416206/10" shall be substituted.

(iv) Against item No. 90 relating to the shares of the Bank of India Limited in column 3 for the distinctive numbers "8680", the distinctive numbers "7680" shall be substituted.

2. In part II of the said Schedule, after item (e) the following item shall be inserted, namely:

"(f) Amount standing in the name of Treasury Officer, Manavadar in current account with the Imperial Bank of India, Rajkot—Rs. 4,909-9-0"

[No. F.6/12/55-Poll.III.]

V. VISWANATHAN, Jt. Secy.

*New Delhi, the 13th December 1955*

**S.R.O. 3658.**—The following draft of certain rules which the Government of ..... proposes to make in exercise of the powers conferred by section 20 of the Prize Competitions Act, 1955 (42 of 1955), is hereby published for the information of persons likely to be affected thereby; and notice is hereby given that the draft will be taken into consideration on or after the.....1956.

The Government of.....shall consider any objection or suggestion which may be received by it from any person with respect to the draft before the date so specified.

### DRAFT RULES

**1. Short title.**—These rules may be called the.....Prize Competitions Rules, 1955.

**2. Definitions.**—In these rules, unless the context otherwise requires,—

(a) "Form" means a form appended to these rules;

(b) "licence" means a licence granted under section 6 of the Act; and

(c) "the Act" means the Prize Competitions Act, 1955 (42 of 1955).

**3. Form and manner of application for licence.**—Every application for a licence under sub-section (1) of section 6 of the Act shall be in Form A and shall be either submitted personally, or sent by registered post, by the applicant to the licensing authority.

**4. Form and particulars of licence.**—(1) Every licence shall be in Form B and shall be subject to the conditions and restrictions therein specified and to the provisions of the Act and these rules.

(2) Every such licence shall be effective throughout the entire State.

**5. Period of validity of licence and its renewal.**—Every licence shall be valid initially for a period of one year from the date of its issue and shall lapse on the expiry of that period; but the licensing authority may on application made by the licensee in this behalf in Form A before the expiry of the period of validity of the licence, renew it from time to time for such further period not exceeding one year in each case as may be decided by that authority in its discretion.

**6. Fees for grant and renewal of licence.**—(1) The fee for every licence shall be—

- (a) Rs. 25 where an entry fee is charged in respect of a prize competition; and
- (b) Rs. 10 where no such entry fee is charged.

(2) Such fee shall be paid by the applicant into a Government treasury or sub-treasury or in the Reserve Bank of India on Government account or paid in cash or sent by money order to the licensing authority.

(3) The fee for the renewal of a licence shall be one-half of the fee leviable for the grant of the original licence.

(4) No application for the grant or renewal of a licence shall be entertained unless the amount of the fee in each case is paid or sent as aforesaid provided that if the licence is not granted or renewal, the applicant shall be entitled to a refund of the fee paid by him.

**7. Limitation for appeals.**—Every appeal to the State Government under section 16 of the Act shall be preferred within a period of thirty days from the date of the decision of the licensing authority.

**8. Bar or transfer of licence.**—No licensee shall sell or otherwise transfer the licence granted to him or enter into any partnership with any person for the purpose of promoting or conducting a prize competition or prize competitions under such licence.

**9. Loss of licence.**—When a licence is lost or destroyed, a duplicate copy thereof may be furnished to the licensee on payment of a fee of—

- (a) Rs. 10 for a licence where an entry fee is levied in the prize competition; and
- (b) Rs. 5 for a licence where no such entry fee is levied.

**10. Production of licence on demand.**—Every person acting under or holding a licence shall produce the same whenever called upon to do so by the licensing authority or by an officer duly empowered by the licensing authority in this behalf.

**11. Entry fee.**—(1) Where an entry fee is charged in respect of a prize competition, such fee shall be paid in money only and not in any other manner.

(2) The maximum amount of an entry fee shall not exceed Re. 1 where the total value of the prize or prizes to be offered is rupees one thousand but not less than rupees five hundred; and in all other cases the maximum amount of an entry fee shall be at the following rates, namely:—

- (a) as. 8 where the total value of the prize or prizes to be offered is less than rupees five hundred but not less than rupees two hundred and fifty; and
- (b) as. 4 where the total value of the prize or prizes to be offered is less than rupees two hundred and fifty.

**12. Maintenance of Register.**—Every licensee shall maintain in respect of each prize competition for which a licence has been granted a register in Form C and shall, for the purpose of ensuring that not more than two thousand entries are received for scrutiny for each such competition, take the following steps, that is to say, shall—

- (a) arrange to receive all the entries only at the place of business mentioned in the licence;
- (b) serially number the entries according to their order of receipt;
- (c) post the relevant particulars of such entries in the register in Form C as and when the entries are received and in any case not later than the close of business on each day; and
- (d) accept for scrutiny only the first two thousand entries as they appear in the register in Form C and ignore the remaining entries, if any, in cases where no entry fee is charged and refund the entry fee received in respect of the entries in excess of the first two thousand

to the respective senders thereof in cases where an entry fee has been charged after deducting the cost (if any) of refund.

**13. Keeping books of accounts.**—The accounts referred to in section 7 of the Act shall be maintained according to the following provisions, namely:—

- (a) there shall be a cash book in Form D and all transactions relating to each prize competition shall be entered in the appropriate sections of the cash book;
- (b) the cash book, both on the receipt side and on the expenditure side, shall be written up day by day, and at the end of each day's transaction the total of receipt and expenditure for the day and the progressive total receipts and expenditure since the commencement of the prize competition to which the entries relate, shall be struck; and
- (c) at the close of each prize competition an abstract of the total receipts and expenditure on account thereof, including the expenditure on the award of prizes shall be exhibited in the cash book itself; and where prizes are awarded to competitors who have submitted free entry coupons, the fact shall be clearly stated and full particulars of such successful competitors shall be clearly and separately shown in the cash book.

**14. Furnishing statement of accounts.**—Every licensee shall, within 15 days of the close of each month, submit to the licensing authority a return in Form E of the total sum received and the total expenditure incurred by such licensee during the month.

**15. Production of register and cash book for inspection.**—Every licensee shall make available for the inspection of the licensing authority or such officer as that authority may nominate in this behalf, at all reasonable times and on demand, the register in Form C, the cash book in Form D and all vouchers and such other papers as may have a bearing on the conduct of the prize competition.

**16. Committee to scrutinise prize competitions.**—(1) As soon as may be after a licence has been granted, the licensing authority shall constitute a committee for the purpose of scrutinising the conduct and result of each prize competition that may be promoted under the licence.

(2) The committee shall consist of a chairman who shall be the licensing authority or any officer of the State Government nominated by the licensing authority and not more than five other members of whom the licensee shall be one and the rest shall be non-officials of standing in the local area concerned, to be appointed by the licensing authority.

#### FORM A

(See Rule 3)

*Application for the grant or renewal of a licence under the Prize Competitions Act, 1955 (42 of 1955)*

The replies to be written in this column.

1. Full name and address of the applicant. ....
  2. Place of business. ....
  - \*3. Particulars of the Prize competition (or competitions) for which licence/renewal of licence is applied for, including the entry fee (if any) to be charged, the value of the prize or prizes to be offered and how the entries will be scrutinised and the prize winning competitors selected. ....
  - \*4. Whether the applicant had applied for a licence before and, if so, with what results. ....
  - \*5. Any further particulars which the applicant may like to furnish. ....
- Date of application. ....

Signature of the applicant.

\**Explanation.*—The applicant shall furnish with the application a specimen entry form and any other literature proposed to be issued in connection with the prize competition.

**FORM B**

(See Rule 4)

*Licence for the promotion and conduct of a Prize Competition (or Competitions) under sub-section (2) of section 6 of the Prize Competitions Act, 1955 (Act 42 of 1955)*

Licence No. ....

Name of licensee,.....

Address.....

Situation and place of business.....

Town or village (Name of street and number of premises in the case of town)..... Taluka..... District.....  
 is hereby granted a licence subject to the provisions of the Prize Competitions Act, 1955 (hereinafter called "the Act") and the rules thereunder for promotion of the prize competition (or competitions) described in the schedule annexed to this licence, for the period from.....19....to.....19....  
 both days inclusive, subject to the conditions hereinafter mentioned, namely:—

*Conditions*

1. The licensee shall afford all facilities for the checking of his accounts and shall, at all reasonable times produce for inspection accounts or other documents and shall furnish fully and correctly any information in his possession as may be required for the purposes of the Act by the Licensing Authority or any officer authorised by the Licensing Authority in this behalf.

2. The licensee shall not vary the details of the competition entrance fee and the prizes stated in respect thereof in the Schedule hereto annexed without the previous permission of the Licensing Authority.

3. The licensee shall state in a prominent place in every publication, ticket or coupon issued in connection with the prize competition(s) that he has obtained such licence and shall also specify in such publication, ticket or coupon the number and date of the licence.

4. The licensee shall not entertain more than two entries from any one competitor and in every prize competition the total number of entries shall not exceed two thousand.

5. In any competition—

- (i) fees payable in respect of all entries offered or allowed by the licensee shall be at uniform rates;
- (ii) the licensee shall not give any rebate or offer any concession whatsoever to any class of competitors;
- (iii) the licensee shall not allow any bonus in any form in addition to the prize or prizes to be given to any competitor;
- (iv) the licensee shall not allow any remuneration, award or prize to any agent for the collection of solutions of competitors.

6. If the licence is suspended or cancelled for any reason, the licensee shall not be entitled to any compensation for such suspension or cancellation or to the refund of any fee paid in respect thereof.

Dated this.....day of.....19....

Seal of the licensing  
 Authority.

Signature of the Licensing Authority.  
 Designation.

**FORM C**

(See Rule 12)

Name of the licensee.....  
 Address at which entries are to be received.....  
 Number of licence.....  
 Nature and description of the Prize competition.....  
 Prize or Prizes offered for the Competition.....  
 Amount of Entry fee.....

Serial No.	Name and address of the competitor	Date of receipt of the entry	Whether received by post or by hand	Is the entry free if not, the amount of fee received
1	2	3	4	5

**FORM D**

(See Rule 13)

1. Name and address of the licensee.
2. Place of business.
3. Number of licence.
4. Nature and description of the prize competition.
5. Prizes offered.

**RECEIPTS****EXPENDITURE**

Date	Name of competitor	S. No. of the entry in the Register in Form 'C'	Amount of entry fee received.	Date	To whom paid	Purpose	Amount
Total for the day.				Total for the day.			
Progressive total (from the commen- cement of the competition)				Progressive total (from the commen- cement of the competi- tion)			

## FORM E

(See Rule 14)

Name and address of the licensee.....

Place of Business.....

Number of Licence.....

Nature and description of the Prize Competition.....

Prizes offered.....

Month	Total No. of coupons received	Total No. of free entry coupons	Total sum received in respect of such compe- tition	Expen- diture	Remarks
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I do hereby declare that I have compared the above particulars with my Register in Form 'C' and the Cash Book in Form 'D' and they are, in so far as I can ascertain, accurate and complete.

Dated this.....day of.....19.....

Signature of the licensee.

[No. 27/23/55-Police.II.]

J. N. DHAMIJA, Dy. Secy.

## MINISTRY OF FINANCE

(Department of Company Law Administration)

(Office of the Controller of Capital Issues)

## ORDER

New Delhi, the 13th December 1955

**S.R.O. 3659.**—In exercise of the powers conferred by sub-section (2) of section 6 of the Capital Issues (Continuance of Control) Act, 1947 (29 of 1947), and in continuation of the order of the Government of India in the Ministry of Finance No. F.1(5)-CCI/55, dated the 21st September, 1955, the Central Government hereby condones the contravention by the National Tubewells Limited (now under liquidation) of the provisions of section 3 of the said Act, that is, the issue of the securities involved in the execution of the following document, namely:—

Surety bond, dated the 12th June, 1953 executed by the Directors of Messrs. National Tubewells Limited guaranteeing to the Governor of Bombay the repayment of the loan of Rs. 9,75,000 (Rupees Nine lakhs and seventy-five thousands only).

[No. F.1(5)-CCI/55/7514.]

D. L. MAZUMDAR,  
Controller of Capital Issues.



**MINISTRY OF FINANCE (REVENUE DIVISION)****ESTATE DUTY**

*New Delhi, the 9th December 1955*

**S.R.O. 3660.**—Whereas in pursuance of the provisions contained in clause (1) of Article 252 of the Constitution of India a resolution has been passed by the Legislature of the State of Mysore on the 18th October 1955, adopting the Estate Duty Act, 1953 (34 of 1953), in so far as it relates to estate duty in respect of agricultural land situate in the said State;

Now, therefore, in pursuance of the provision contained in sub-section (2) of section 5 of the said Act, the Central Government hereby adds the name of the State of Mysore to the First Schedule thereof.

[No. 18/2/54-E.D.]

A. C. BOSE, Jt. Secy.

**CUSTOMS**

*New Delhi, the 17th December 1955*

**S.R.O. 3661.**—In exercise of the powers conferred by section 23 of the Sea Customs Act, 1878 (VIII of 1878), as in force in India and as applied to the State of Pondicherry, the Central Government hereby exempts methyl alcohol imported into India or the State of Pondicherry and falling under item 22(4)(a) of the First Schedule to the Indian Tariff Act, 1934 (XXXII of 1934), from so much of the duty of customs leviable thereon under the latter Act, as is in excess of the duty of 37.8 per cent. *ad valorem*.

[No. 191.]

E. S. KRISHNAMOORTHY, Jt. Secy.

**CENTRAL EXCISES**

*New Delhi, the 17th December 1955*

**S.R.O. 3662.**—In exercise of the powers conferred by sub-rule (1) of rule 8 of the Central Excise Rules, 1944, as in force in India and as applied to the State of Pondicherry, the Central Government hereby exempts all paper containing more than 50 per cent. of mechanical woodpulp from the excise duty leviable thereon under section 3 of the Central Excises and Salt Act, 1944 (I of 1944), provided that it is proved to the satisfaction of the proper officer, as defined in the said rules, that the paper is intended for use in the printing of newspapers.

[No. CER8(8)/55.]

**S.R.O. 3663.**—In exercise of the powers conferred by section 37 of the Central Excises and Salt Act, 1944 (I of 1944), as in force in India and as applied to the State of Pondicherry, the Central Government hereby makes the following further amendment in the Central Excise Rules, 1944, namely:—

To rule 215 of the said rules, the words "or under these rules" shall be added.

[No. 2-CER/55.]

W. SALDANHA, Dy. Secy.

**ORDER****STAMPS**

*New Delhi, the 6th December 1955*

**S.R.O. 3664.**—In exercise of the powers conferred by clause (a) of sub-section (i) of section 9 of the Indian Stamp Act, 1899 (II of 1899), the Central Government hereby remits the whole of the Stamp duty chargeable under sub-section (i) of section 8 of the said Act on the debentures of Rs. 25 lakhs to be issued by the Municipal Committee, Sagar, to the United Western Bank Limited, Satara and the Punjab National Bank.

[No. 22.]

C. T. A. PILLAI, Under Secy.

**CENTRAL BOARD OF REVENUE****CUSTOMS***New Delhi, the 10th December 1955*

**S.R.O. 3665.**—In exercise of the powers conferred by sub-section (1) of section 3 of the Land Customs Act, 1924 (XIX of 1924) read with the notification of the Government of India in the late Finance Department (Central Revenues) No. 5944, dated the 13th December, 1924, the Central Board of Revenue hereby appoints for the areas adjoining the foreign frontier separating East Pakistan from India, the officers of the Government of West Bengal specified in the schedule hereto annexed and having jurisdiction in such areas to be Land Customs Officers within the jurisdiction of the Collector of Land Customs, Calcutta.

**THE SCHEDULE**

- (1) Superintendents of Police.
- (2) Deputy Superintendents of Police/Assistant Superintendents of Police.
- (3) Circle Inspectors of Police.
- (4) Sub-Inspectors of Police.
- (5) Assistant Sub-Inspectors of Police.
- (6) Head Constables.
- (7) Constables.

[No. 190.]

W. SALDANHA, Secy.

**MINISTRY OF COMMERCE AND INDUSTRY***New Delhi, the 6th December 1955*

**S.R.O. 3666.**—In exercise of the powers conferred by sub-clause (b) of clause 2 of the Iron and Steel (Scrap Control) Order, 1943, the Central Government is pleased to direct that the following amendment shall be made in the Notifications of the Government of India in the late Ministry of Industry and Supply No. I(1)-4(78)A, dated the 6th January, 1951, No. I(1)-4(78)B, dated the 8th January, 1951, and No. I(1)-4(78)C, dated the 6th January, 1951, as amended from time to time, namely:—

In the Schedule annexed to each of the said notifications, for the entry—

“Director of Food and Civil Supplies, Ajmer.”, the entry—

“Additional Assistant Commissioner and Officer Incharge Food and Civil Supplies, Ajmer.”

shall be substituted.

[No. SC(A)-4(253)-A/55.]

**S.R.O. 3667.**—In exercise of the powers conferred by sub-clause (a) of Clause 2 of the Iron and Steel (Control of Production and Distribution) Order, 1941, the Central Government is pleased to direct that the following amendment shall be made in the Notifications of the Government of India in the late Ministry of Industry and Supply, No. I(1)-4(41), dated the 7th September, 1950, No. I(1)-1(106), dated the 8th March, 1948, No. I(1)-1(530)D, dated the 26th May, 1948 and No. I(1)-1(699)48-B, dated the 16th August, 1948, as amended from time to time, namely:—

In the Schedule annexed to each of the said notifications, for the entry—

“Director of Food and Civil Supplies, Ajmer.” the entry—

“Additional Assistant Commissioner & Officer Incharge Food and Civil Supplies, Ajmer.”

shall be substituted.

[No. SC(A)-4(253)/55.]

M. R. MENON, Under Secy.

## TEA CONTROL

*New Delhi, the 6th December 1955*

**S.R.O. 3668.**—The following amendments to the Tea Board By-laws, 1955, made by the Tea Board in exercise of the powers conferred by sub-section (1) of section 50 of the Tea Act, 1953 (29 of 1953), are hereby published for general information, the said amendments having been confirmed by the Central Government as required by sub-section (2) of the said section, namely:—

In the said by-laws—

1. for the existing by-law 20, the following shall be substituted, namely:—

“20. Creation of, and appointment to, posts.—

(1) creation of posts the maximum salary of which does not exceed Rs. 500/- p.m. shall be governed by the following provisions, namely:—

- (i) The Executive Committee shall have powers to create posts under the Board, the maximum salary of which does not exceed Rs. 500/- per month subject to approval by the Board at its next succeeding meeting.
- (ii) The Chairman shall have powers to create temporary posts carrying a salary not exceeding Rs. 250/- per month for a period of three months subject to approval by the Executive Committee.
- (iii) The competent authority to create a post specified under (i) and (ii) above shall have powers to lay down qualifications for the respective posts.

(2) All appointments to posts, the maximum salary of which is less than Rs. 1,000 per month shall be governed by the following provisions, namely:—

- (i) An appointment to a post the maximum salary of which exceeds Rs. 500 per month shall be made by the Board with the previous sanction of the Central Government.
- (ii) The Executive Committee may make an appointment to a post the maximum salary of which exceeds Rs. 250 but does not exceed Rs. 500 per month.
- (iii) The Chairman may make an appointment to a post the maximum salary of which exceeds Rs. 50 but does not exceed Rs. 250 per month.
- (iv) The Chairman shall have powers, in urgent cases and to meet exigencies of work, to make temporary or officiating appointment to any post the maximum salary of which exceeds Rs. 250 but does not exceed Rs. 500 per month, for a period not exceeding three months, within which period approval of the Executive Committee for such appointment shall be taken.
- (v) The Secretary or an officer of the Board so authorised by the Chairman may make an appointment to a post, the maximum salary of which does not exceed Rs. 50 per month.”

2. For the existing first proviso to by-law 21, the following proviso shall be substituted, namely:—

“Provided that the appointing authority as specified under by-law 20(2) shall have powers, in its discretion, to relax the age limit of candidates upto seven years.”

[No. F.32(5)Plant/54.]

P. V. RAMASWAMY, Under Secy.

*New Delhi, the 17th December 1955*

**S.R.O. 3669.**—In exercise of the powers conferred by sub-section (1) of Section 26 of the Coir Industry Act, 1953 (45 of 1953), the Central Government hereby make the following amendment to the Coir Industry Rules 1954, the same having been previously published as required by the said sub-section, namely:—

For sub-rule (I) of rule 9 of the said rules, the following sub-rule shall be substituted, namely:—

“(1) The Board shall, in each year, elect a member to be its Vice-Chairman, and he shall hold office for a period of twelve months commencing

from the date of his election or till his successor is elected, whichever is later."

[No. 42-SSI(B) (7)/54.]

N. S. VAIDYANATHAN, Under Secy.

(Indian Standards Institution)

Delhi, the 2nd December 1955

**S.R.O.3670.** —In pursuance of sub-regulations (2) and (3) of regulation 3 of the Indian Standards Institution (Certification Marks) Regulations, 1955, the Indian Standard Institution hereby notifies that the Indian Standards, particulars of which are given in the Schedule hereto annexed, have been established during the period 12th November to 2nd December 1955.

THE SCHEDULE

Sl. No.	No. and title of the Indian Standards established	No. and title of the Indian Standard or Standards, if any, superseded by the new Indian Standard	Brief Particulars
(1)	(2)	(3)	(4)
1.	IS : 440-1955 Methods for Chemical Analysis of Copper.	..	This Standard covers the method of sampling and test procedures for the determination of copper, lead, tin, nickel, iron, arsenic, antimony, bismuth, selenium, tellurium and oxygen in various grades of copper used in industry. (Price Rs. 2/-).
2.	IS : 562-1955 Specification for BHC, Technical.	..	These two Standards cover the chemical and physical requirements, including the percentage of the active principle, and texture and particle size of the material, and methods of tests for BHC (Benzene Hexachloride), technical and BHC Water dispersible powder concentrates. The former is employed in the preparation of insecticides. The latter, containing varying percentages of gamma isomer of BHC, is used in the control of insect pests of medical, veterinary, animal husbandry and agricultural importance. Particular care has been taken to stipulate in these standards such requirements as would meet the need of the tropical and sub-tropical conditions obtaining in India. (Price of each Standard Rs. 2/-).
3.	IS : 562-1955 Specification for BHC, Water Dispersible Powder Concentrates.		
4.	IS : 638-1955 Specification Rubber and for Insertion Jointing.	..	This standard prescribes requirements for rubber and insertion jointing for use between flanges and similar joints subjected to (i) water pressure at normal atmospheric temperatures, and (ii) steam pressure up to 50 lb per sq. in. (Price Rs. 1/8/-).

Copies of these standards are available for sale with the Secretary (Administration), Indian Standards Institution, 19, University Road, Delhi-8.

D. V. KARMAKAR,  
Deputy Director (Marks).

[No. MDC/II (4).]

T. S. RAMASWAMI, Under Secy.

## ORDER

New Delhi, the 12th December 1955

**S.R.O. 3671/IDRA/6/1/Am(6).**—In exercise of the powers conferred by Section 6 of the Industries (Development and Regulation) Act, 1951 (LXV of 1951), the Central Government hereby appoints Dr. P. K. Kapre, Ph.D. (London), Director, Philips Electrical Company (India) Ltd., 32, Golf Link Road, New Delhi, to be a member of the Development Council established for the group of scheduled industries engaged in the manufacture and production of telephones, telegraph apparatus and wireless communication apparatus, electric lamps, electric fans, batteries dry cells and storage, radio receivers and house service meters and panel instruments, and directs that the following amendment shall be made in the Order of the Government of India in the Ministry of Commerce and Industry No. S.R.O. 351/IDRA/6/1, dated the 1st February 1955, namely:—

In paragraph 1 of the said order, under the category of members "being persons who in the opinion of the Central Government have special knowledge of matters relating to the technical or other aspects of the group of the said scheduled industries", after entry No. 8A relating to Shri J. P. Mehrotra, the following entry shall be inserted, namely:—

"8B. Dr. P. K. Kapre, Ph.D. (London), Director, Philips Electrical Company (India) Ltd., 32, Golf Link Road, New Delhi."

[No. 5(14)IA(G)/55.]

D. N. KRISHNAMURTHY, Under Secy.

**MINISTRY OF TRANSPORT**  
(Transport Wing)

PORTS

New Delhi, the 7th December 1955

**S.R.O. 3672.**—In exercise of the powers conferred by sub-section (1) of section 6 of the Indian Ports Act, 1908 (XV of 1908), the Central Government hereby directs that the following further amendments shall be made in the Bombay Port Rules, 1925 published with the notification of the Government of Bombay in the late Marine Department, No. 441/42.M, dated the 19th January, 1925, the same having been previously published as required by sub-section (2) of the said section, namely:—

In the said Rules—in Part I—

(a) in rule 2, for the words "a Surveyor or an officer", the words "the Inspector of Explosives or the Assistant Inspector of Explosives, West Circle, Bombay or any other officer" shall be substituted;

(b) in clause (2) of rule 16—

(i) in sub-clause (a), for the words "Government of Bombay", the word "Government" shall be substituted;

(ii) in sub-clause (b), for the words "a Surveyor or other officer appointed by the Government of Bombay", the words "the Inspector of Explosives or the Assistant Inspector of Explosives, West Circle, Bombay or any other Officer appointed in this behalf by Government" shall be substituted;

(c) in rule 19—

(i) in the opening paragraph, for the words "a Survey or an officer", the words "the Inspector of Explosives or the Assistant Inspector of Explosives, West Circle, Bombay or any other officer" shall be substituted;

(ii) in the proviso, for the words "Chemical Analyser to Government" the words "the said Inspector of Explosives, Assistant Inspector of Explosives or other officer appointed by Government in this behalf", shall be substituted;

(d) in rule 7 of Part III, for the words "a Surveyor or an Officer", the words "the Inspector of Explosives or the Assistant Inspector of Explosives, West Circle, Bombay, or any other officer" shall be substituted.

[No. 8-PI(23)/52.]

K. NARAYANAN, Under Secy.

**(Transport Wing)****MERCHANT SHIPPING***New Delhi, the 12th December 1955*

**S.R.O. 3673.**—In exercise of the powers conferred by section 4 of the Coasting Vessels Act, 1838 (XIX of 1938), the Central Government hereby appoints the following Assistant Conservators at the minor ports in the State of Kutch to act at the ports under their respective control in execution of the said Act:—

- (1) Assistant Conservator, Mandvi,
- (2) Assistant Conservator, Mundra,
- (3) Assistant Conservator, Jakhau,
- (4) Assistant Conservator, Koteswar,
- (5) Assistant Conservator, Lakhpat.

[No. 33-MA(5)/55.]

S. K. GHOSH, Dy. Secy.

**MINISTRY OF REHABILITATION***New Delhi, the 6th December 1955*

**S.R.O. 3674.**—In exercise of the power conferred by sub-section (1) of section of the Administration of Evacuee Property Act, 1950 (XXXI of 1950), the Central Government hereby appoint for the State of Delhi, in consultation with the Custodian General of Evacuee Property, Shri Goswami Padam Nabh as Assistant Custodian (Rural) of Evacuee Property, in the Office of the Additional Custodian of Evacuee Property (Rural), Delhi, for the purpose of discharging the duties imposed on the Custodian by or under the said Act, within the said State.

[No. XVI-8(125)/55-Prop.II.]

*New Delhi, the 17th December 1955*

**S.R.O. 3675.**—In exercise of the powers conferred by sub-section (1) of section 6 of the Administration of Evacuee Property Act, 1950 (XXXI of 1950), the Central Government hereby appoint for the State of Ajmer, Sarvashri Madan Gopal Tosniwal and M. N. Mathur, Managing Officers in the office of the Regional Settlement Commissioner, Ajmer, as Assistant Custodians of Evacuee Property, for the purpose of discharging the duties imposed on the Custodian by or under the said Act, with the said State, with effect from 1st November, 1955.

[No. XVI-10(19)/55.P-II.]

**S.R.O. 3676.**—In exercise of the power conferred by sub-section (1) of section 6 of the Administration of Evacuee Property Act, 1950 (XXXI of 1950), the Central Government hereby appoint for the State of Ajmer, the Regional settlement Commissioner, Ajmer, as Custodian of Evacuee Property, for the purpose of discharging duties imposed by or under the said Act, within the said State, with effect from the 1st November 1955.

[No. XVI-10(19)/55-PIL.]

J. J. KARAM, Under Secy.

**MINISTRY OF LABOUR***New Delhi, the 7th December 1955*

**S.R.O. 3677.**—Whereas the Central Government is satisfied that the employees in the National Instruments Factory, Calcutta, which is a factory belonging to the Government of India, are in receipt of benefits substantially similar or superior to the benefits provided under the Employees' State Insurance Act, 1948 (XXXIV of 1948);

Now, therefore, in exercise of the powers conferred by section 90 of the said Act, the Central Government hereby exempts the said factory from all the provisions of the said Act for a period of one year with effect from the 7th December 1955.

[No. SS.138(156).]

**S.R.O. 3678.**—In pursuance of section 10 of the Employees' State Insurance Act, 1948 (XXXIV of 1948), the Central Government hereby makes the following further amendment in the notification of the Government of India in the Ministry of Labour, No. S.R.O. 1209, dated the 6th April, 1954, constituting the Medical Benefit Council, namely:—

In the said notification, for item (19), the following item shall be substituted, namely:—

“(19) Dr. Jagdish Singh, Director of Health Services, Patiala and East Punjab States Union, Patiala.”

[No. SS.121(117).]

*New Delhi, the 12th December 1955*

**S.R.O. 3679.**—In pursuance of section 4 of the Employees' State Insurance Act, 1948 (XXXIV of 1948), the Central Government hereby nominates Shri R. P. Mishra, Labour Commissioner, Madhya Pradesh, Nagpur, to be a member of the Employees' State Insurance Corporation in the place of Shri P. K. Sen, and makes the following further amendment in the notification of the Government of India in the Ministry of Labour No. S.R.O. 2155, dated the 16th November, 1953, namely:—

In the said notification, for item 11 the following item shall be substituted, namely:—

“Shri R. P. Mishra, Labour Commissioner, Madhya Pradesh, Nagpur.”

[No. S.S.121(121)/55.]

K. N. NAMBIAR, Under Secy.

*New Delhi, the 13th December 1955*

**S.R.O. 3680.**—In exercise of the powers conferred by sections 7 and 9 of the Minimum Wages Act, 1948 (XI of 1948), the Central Government hereby nominates Shri N. M. Patnaik, I.A.S., Chief Labour Commissioner (Central), Ministry of Labour, New Delhi, to be the Chairman of the Advisory Board appointed in the notification of the Government of India in the Ministry of Labour No. S.R.O. 2088 dated the 21st June, 1954, as amended *vice* Shri P. M. Sundaram, Deputy Secretary to the Government of India, Ministry of Labour, New Delhi, and makes the following further amendment in the said notification, namely:—

In the said notification, under the heading “(1) Independent members”, for the entry, “1. Shri P. M. Sundaram, Deputy Secretary to the Government of India, Ministry of Labour, New Delhi... Chairman”, the entry “1. Shri N. M. Patnaik, I.A.S., Chief Labour Commissioner (Central), Ministry of Labour, New Delhi... Chairman” shall be substituted.

[No. LWI-6(7)/55.]

**S.R.O. 3681.**—In pursuance of the powers conferred by sections 6 and 9 of the Minimum Wages Act, 1948 (XI of 1948), the Central Government hereby nominates Shri N. M. Patnaik, I.A.S., Chief Labour Commissioner (Central), Ministry of Labour, New Delhi, to be the Chairman of the Advisory Committee appointed in the notification of the Government of India in the Ministry of Labour, No. S.R.O. 2087 dated the 21st June, 1954, *vice* Shri P. M. Sundaram, Deputy Secretary to the Government of India, Ministry of Labour, New Delhi, and makes the following further amendment in the said notification, namely:—

In the said notification, under the heading “(1) Independent member”, for the entry “1. Shri P. M. Sundaram, Deputy Secretary to the Government of India, Ministry of Labour, New Delhi... Chairman”, the entry “1. Shri P. M. Patnaik, I.A.S., Chief Labour Commissioner (Central), Ministry of Labour, New Delhi... Chairman” shall be substituted.

[LWI-6(11)/55.]

F. M. NATHANIEL, Under Secy.

*New Delhi, the 10th December 1955*

**S.R.O. 3682.**—In pursuance of section 17 of the Industrial Disputes Act, 1947 (XIV of 1947), the Central Government hereby publishes the following award of the Industrial Tribunal, Delhi, in the matter of an application under section 33A of the said Act from Shri Sumar Chand Jain, an employee of the Punjab National Bank Limited.

**BEFORE SHRI RAM KANWAR, CENTRAL GOVERNMENT INDUSTRIAL TRIBUNAL, DELHI**

**REFERENCE No. L.R. 100(98), DATED 2ND SEPTEMBER, 1953**

**In the matter of an Industrial Dispute**

**BETWEEN**

**The Management in relation to the Punjab National Bank Ltd. and its workmen.**

**APPLICATION OF SUMER CHAND JAIN UNDER SECTION 33-A OF THE INDUSTRIAL DISPUTES ACT, 1947**

**PRESENT**

**Nemo for the petitioner.**

**Shri M. K. Jain for the Bank.**

**AWARD**

During the pendency of proceedings before this tribunal in respect of an Industrial Dispute between the Punjab National Bank Ltd. and its workmen, this application was received by registered post on the 24th August, 1955 and 27th August, 1955 was fixed as the date of hearing. The petitioner was appointed as an assistant cashier in the Bank's Khari Baoli Branch of Delhi on the 1st December, 1954 and was dismissed from its service on 4th August, 1955. His allegations are that his work and conduct was quite satisfactory and that the Bank had acted in breach of Section 33 of the Industrial Disputes Act in terminating his services.

The Bank opposed the application and contended that the petitioner was appointed as Assistant Cashier by the Contractor Cashier Shri Sunder Lal Jain on a temporary basis, when it was brought to his notice by the Bank authorities that the branch needed an extra hand as a temporary measure to meet the increase of work in the Cash Department. On the 27th August, 1955 Shri H. L. Puri, an Officer of the Bank Employees Union put in appearance on behalf of the petitioner and the case was adjourned to the 5th September, 1955 for the Bank's reply.

On the 5th September, 1955 there was no appearance on behalf of the petitioner but a letter was received from Shri H. L. Puri stating that he was too ill to attend the tribunal. The case was, therefore, adjourned to the 16th September, 1955 and Shri H. L. Puri was informed of the next date of hearing by registered post.

On the 16th September, 1955 again there was no appearance on behalf of the petitioner. Shri H. L. Puri sent a letter stating that he would be unable to attend the tribunal that day due to his illness. The case was, therefore, postponed to the following day. As there is no appearance even on this day, the application is dismissed for default and an award is made accordingly. Let a copy of it be sent to the Labour Ministry, Government of India for action under Section 33-A of the Industrial Disputes Act.

No order as to costs.

DELHI;

*The 17th September, 1955.*

(Sd.) RAM KANWAR,

Industrial Tribunal.

[No. LR.100(98)/53-I.]

**S.R.O. 3683.**—In pursuance of section 17 of the Industrial Disputes Act, 1947 (XIV of 1947), the Central Government hereby publishes the following award of the Industrial Tribunal, Delhi, in the matter of an application under section 33A of the said Act from Shri Madan Mohan Katyal, an employee of the Punjab National Bank Limited.



**BEFORE SHRI RAM KANWAR, CENTRAL GOVERNMENT INDUSTRIAL  
TRIBUNAL, DELHI**

REFERENCE No. L.R. 100(98), DATED 2ND SEPTEMBER, 1953

In the matter of an Industrial Dispute

BETWEEN

The Management in relation to the Punjab National Bank Ltd., and its workmen.

APPLICATION OF MADAN MOHAN KATYAL UNDER SECTION 33-A OF THE INDUSTRIAL  
DISPUTES ACT, 1947

PRESENT

Nemo for the petitioner.

Shri M. K. Jain for the Bank.

**AWARD**

During the pendency of proceedings before this tribunal in respect of an Industrial Dispute between the Punjab National Bank Ltd., and its workmen, the Bank made on the 16th June, 1955 an application under Section 33 of the Industrial Disputes Act for permission to dismiss the present petitioner Madan Mohan Katyal a godown keeper in its branch at Jhansi. While the petitioner by way of counter blast made this application on the 9th September, 1955 with a prayer for the setting aside the order of suspension made against him by the Bank, on 22nd September, 1953 and for payment of back emoluments in full to him. His allegation is that the suspension was made without any enquiry by the Bank and without giving him an opportunity to meet the case of the Bank against him.

The application was opposed by the Bank.

After full enquiry the Bank's application was allowed by me by my order of today's date. At the time of the arguments on the Bank's application, this application was not at all pressed by the petitioner. The result, therefore, is that the application is rejected and an award is made accordingly. Let a copy of it be sent to the Ministry of Labour, Government of India.

No order as to costs.

(Sd.) RAM KANWAR,  
Industrial Tribunal.  
[No. LR-100(98)53-II.]

*Delhi, the 28th September 1955*

**S.R.O. 3684.**—In pursuance of section 17 of the Industrial Disputes Act, 1947 (XIV of 1947), the Central Government hereby publishes the following award of the Industrial Tribunal, Delhi, in the matter of an application under section 33A of the said Act from Shri Suresh Bahadur Singh, an employee of the Punjab National Bank, Limited.

**BEFORE SHRI RAM KANWAR, CENTRAL GOVERNMENT INDUSTRIAL  
TRIBUNAL, DELHI**

REFERENCE No. L.R.100(98), DATED 2ND SEPTEMBER, 1953.

In the matter of an Industrial Dispute

BETWEEN

The Management in relation to the Punjab National Bank Ltd., and its workmen.

APPLICATION OF SURESH BAHADUR SINGH UNDER SECTION 33-A OF THE  
INDUSTRIAL DISPUTES ACT, 1947

PRESENT

Nemo for the petitioner; and

Shri M. K. Jain for the Bank.

**AWARD**

During the pendency of proceedings before this Tribunal in respect of an Industrial Dispute between the Punjab National Bank Ltd., and its workmen, the Bank made on 5th May, 1955 an application under Section 33 of the Industrial Disputes Act for permission to dismiss the present petitioner Suresh Bahadur Singh a godown keeper, in its branch at Gorakhpur. While the representative of Suresh Bahadur Singh during the proceedings of the Bank's application, by way

of counter-blast made this application under his own signatures and without any attestation by anybody on 12th July, 1955 under Section 33-A for the following reliefs:—

- (i) The Bank be asked to pay the difference between  $\frac{1}{3}$  and  $\frac{1}{2}$  of the basic pay and D.A. and the total emoluments respectively with effect from 1st April, 1954, and
- (ii) The Bank be directed to make the further payment in regard to the suspension period at the rate prescribed by the Sastry Award. The Bank opposed the application and also raised the preliminary objections
- (a) that the application was not properly presented, neither was it attested nor signed by the petitioner;
- (b) That the petitioner was not discharged or punished, nor the conditions of service applicable to him immediately before the commencement of proceedings before this Tribunal were altered to his prejudice. On merits it was contended that the Sastry Award came into force with effect from 26th August, 1954 and that this Tribunal has no jurisdiction to decide disputes relating to alleged contravention of provisions of the Sastry Award.

This Application came up for hearing with the application of the Bank. As there was no appearance on behalf of the petitioner on 12th August, 1955, the Bank's application was adjourned for *ex-parte* evidence of the bank in its support, while the present application was dismissed for default. The Bank's application was ultimately allowed *ex-parte* today.

An Award is, therefore, made in accordance with the dismissal of the application in default. Let a copy of it be sent to the Ministry of Labour Government of India.

No order as to costs.

DELHI;

The 17th October, 1955.

(Sd.) RAM KANWAR,  
Industrial Tribunal.

[No. LR-100(98)/53-III.]

New Delhi, the 13th December 1955

**S.R.O. 3685.**—In exercise of the powers conferred by clause (c) of sub-section (1) of section 23A of the Industrial Disputes (Appellate Tribunal) Act, 1950 (XLVIII of 1950), the Central Government hereby specifies the Industrial Tribunal at Madras, constituted under section 7 of the Industrial Disputes Act, 1947 (XIV of 1947), in the notification of the Government of India in the Ministry of Labour No. S.R.O. 3648 dated the 3rd December 1955, as an industrial tribunal to which any such proceeding as is referred to in the said sub-section may be transferred under that sub-section.

[No. LR1(33)/55.]

**S.R.O. 3686.**—In pursuance of clause (1) of Article 243 of the Constitution, the President hereby directs that the Chief Commissioner, Andaman and Nicobar Islands, shall, subject to the control of the President, exercise the powers and discharge the functions of the Central Government under the Industrial Disputes Act, 1947 (XIV of 1947), except section 38 thereof.

[No. LR.1(59)/55.]

**S.R.O. 3687.**—In exercise of the powers conferred by sub-section (1) of section 6 of the Industrial Disputes (Banking Companies) Decision Act, 1955 (41 of 1955), the Central Government hereby specifies the Central Government Industrial Tribunal at Madras, constituted under section 7 of the Industrial Disputes Act, 1947 (XIV of 1947), in the notification of the Government of India in the Ministry of Labour No. S.R.O. 3648, dated the 3rd December 1955, as an industrial tribunal to which any matter as is referred to in the said sub-section may be referred for decision under that sub-section.

[No. LR-100(88)/55.]

P. S. EASWARAN, Under Secy.

*New Delhi, the 7th December 1955*

**S.R.O. 3688.**—In pursuance of section 27 of the Mines Act, 1952 (XXXV of 1952), the Central Government hereby publishes the report submitted to it under sub-section (4) of section 24 of the said Act by the Court of Inquiry appointed to hold an inquiry into the causes of, and circumstances attending the accident which occurred on the 5th February, 1955 at the Amlabad Colliery in the Jharia Coalfields.

### I—INTRODUCTORY

By notification No. S.R.O. 338, dated the 9th February, 1955, the Government of India in the Ministry of Labour appointed me under section 24 of the Mines Act, 1952, to hold an inquiry into the causes of, and the circumstances attending, the accident which occurred in the Amlabad Colliery in the Jharia Coalfields on the 5th February, 1955.

2. Under the notification mentioned above, the Government of India had also appointed two persons to act as Assessors in holding the inquiry, namely, (1) Shri Awadheshwar Prasad Sinha, M.P., New Delhi, and (2) Shri M. L. Shome, Chief Mining Engineer, Coal Board, Calcutta. But Shri Awadheshwar Prasad Sinha submitted his resignation, and, in the vacancy thus caused, the Government of India, by a notification dated the 1st March, 1955, appointed Shri Sree Narayan Das, M.P., New Delhi, to act as an Assessor in holding the inquiry.

3. The first sitting of the Court was held on the 4th March, 1955, and before that date a public notice had been given to that effect, and written statements were invited supported with documents, if any, from persons possessing any knowledge of the accident or of matters relevant to the inquiry. The notice was published in two issues of an English daily, "The Indian Nation", a Hindi daily, "The Pradip", and a Bengali daily, "The Anand Bazar Patrika". A notice to that effect was also affixed at a conspicuous place at the Colliery, and a gist of it was proclaimed by beat of drum in the locality.

4. The Court of Inquiry sat for recording the evidence at the Mines Rescue Station at Jharia and for hearing arguments at the Patna High Court. 29 witnesses were examined in all. The Management examined 8 witnesses on their behalf, and the Department of Mines examined 2. The Court examined 19 witnesses to assist it at the inquiry. A list of the witnesses examined will be found in Appendix I attached to the report. The number of days occupied in recording the evidence was 22, and it took 440 pages to record it. Several documents were exhibited at the inquiry. The hearing of the argument for the various parties lasted for twelve days. An inspection of the mine both underground and on the surface was made on the 4th March, the 7th April and the 15th July, 1955.

Written statements were filed on behalf of (1) the Eastern Coal Co. Collieries Workers' Union, Bhowra, (2) the Bihar Committee of the All India Trade Union Congress, Dhanbad, (3) Messrs Karam Chand Thapar & Bros., Ltd., (4) the Bihar Colliery Mazdoor Sangh, and (5) the Department of Mines.

5. At the commencement, Mr. S. K. Acharya, Advocate, represented the Eastern Coal Co. Collieries Workers' Union and the Bihar Committee of the All India Trade Union Congress; Messrs S. Banerji and S. C. Banerji, Advocates, represented the Management (Messrs Karam Chand Thapar & Bros. Ltd.); Messrs Brajeshwar Prasad Sinha and P. Banerji, Advocates, represented the Bihar Colliery Mazdoor Sangh; and Mr. Gauri Ram, Government Pleader, Dhanbad (with Mr. S. S. Grewal, Chief Inspector of Mines in India), represented the Department of Mines. Mr. B. M. Chatterji, a representative of the Indian Mine Managers' Association, and Mr. P. S. Jagpal, a representative of the National Association of Colliery Managers, were permitted, at their request, to watch the proceedings of the Court as observers. At the later stages of the inquiry, Mr. S. K. Acharya retired from the inquiry, and Mr. Brajeshwar Prasad Sinha cross-examined the witnesses as also presented the argument on behalf of the Eastern Coal Co. Collieries Workers' Union and the Bihar Committee of the All India Trade Union Congress as well. Mr. S. Banerji also retired in the later stages, and left the inquiry in the hands of Mr. S. C. Banerji for the Management, and he represented the Management throughout.

6. A list of the persons killed and injured in the explosion will be found in Appendix II attached to the report.

## II—GENERAL INFORMATION

7. *Situation of the Mine.*—The colliery is situated in Purulia Sadar Subdivision of Manbhum District in Bihar. It lies on the southern bank of Damodar River which separates Purulia Subdivision from Dhanbad Subdivision. It is thirteen miles from Dhanbad, and is approachable by a road which goes up to the northern bank of the river. During the rains, the river is crossed by boat, and, in fair weather, a temporary wooden bridge is constructed. The mine is situated about half a mile from the southern bank of the river.

8. *Management.*—The principal officials connected with the colliery are:—

Director	Shri K. C. Thapar.
Chief Mining Engineer	Shri J. N. Banerji.
Agent	Shri J. R. Sharma.
Manager	Shri K. Dutt.
Assistant Manager	Shri N. K. Chatterjee.
General Supervisor	Shri S. K. Khosla.

9. *Brief history of the Mine.*—The colliery was started in the year 1917 by the Eastern Coal Co. Ltd. under the Managing Agency of Messrs Mackinnon Mackenzie & Co. The Managing Agents changed hands in the year 1951 when Messrs Macneill & Barry Ltd. become the new Managing Agents of Messrs Eastern Coal Co. Ltd. The mine passed into the hands of Messrs Bhowra-Kankanee Collieries, Ltd. with Messrs Karam Chand Thapar & Bros. Ltd. as Managing Agents in the month of January, 1955.

Seven seams have been proved in the Amlabad Mine, namely, Nos. 19, 18, 17, 16, 16-A, 15 and 14. The first is the topmost one, and the rest follow in the order I have given. We are concerned with No. 18 seam in this inquiry. Three shafts had been sunk to develop Nos. 18, 17 and 16 seams. No. 1 shaft, which goes down to No. 18 seam, is 441 feet deep. The depths of Nos. 2 and 3 shafts, which are sunk down to Nos. 16 and 17 seams, are 827 feet and 725 feet, respectively. Nos. 18, 17 and 16 seams are respectively, 11 feet, 10 feet and 8 feet in thickness. Nos. 1 and 3 shafts are downcast, and No. 2 is upcast. No. 2 is used as a main man-riding pit; No. 1 is used for winding coal of 18 seam; and No. 3 is at present out of commission. All the three seams mentioned above were worked in the past; but coal raising from Nos. 17 and 16 seams was stopped in the year 1951, and it is No. 18 seam only which is being worked since that time.

There are three district in No. 18 seam in the Amlabad Colliery: (1) east, (2) west and (3) south. The direction is taken from the pit-bottom of shaft No. 1. For several months before the accident, coal was being worked from the west and the south districts only. In the east district, dewatering had been completed, and arrangements were being made to start coal-raising from this district as well.

The accident took place in the south district. The working places in the south district are three in number, and are generally known as (1) endless rise section also called endless rise, rise of endless and main south level rise, (2) south-west cross-cut section, and (3) south main dip section also called new dip section, mid-section, new line and new haulage line.

The main dip section was the normal working section, and depillaring work was being done in conjunction with hydraulic sand stowing. The depillaring work and the hydraulic sand stowing in the main south level section, which is on the south-east side of the 60 H.P. main dip haulage, had been finished sometime before the occurrence. The endless rise area section is described as the development section. This is the area affected. The other two sections in the south district are towards the south west of the affected area.

The Manager has stated that the total number of persons working in the mine is 1,200, out of whom about 100 work in the south district in each shift, and not more than 20 used to work in the endless rise section.

According to the evidence of the Agent, the output of the colliery is about 7,500 tons per month. Three different Daily Examination Report Books are maintained separately for each of the three districts. The report in respect of the south district is exhibit A, in respect of the west district is exhibit A-1, and in respect of the east district is exhibit A-2.

10. *Shifts.*—As is common in most mines, there are three shifts: the first or the morning shift is from 8 A.M. to 4 P.M., the second or back shift is from 4 P.M. to 12 midnight, and the third or the night shift is from 12 midnight to 8 A.M. The

accident took place in the morning shift, at about 3 or 3-30 P.M., of the 5th February, 1955.

11. *Electric haulage engines.*—In the affected area, there are two 60 H.P. and one 10 H.P. electric haulage engines and three signal bells. One 60 H.P. haulage is certified flame-proof, and the other two are not so certified. The Manager has admitted that these two non-flame proof engines are liable to give open sparks, if not properly maintained. And he further said that non-flame proof engines can be installed underground, but, if the Electrical Inspector of Mines objects, they must be removed, otherwise they can be made use of. These engines were at their respective places since 15 or 20 years and the Electrical Inspector never took exception to their use. Their voltage is 550. The 60 H.P. main dip haulage road and the 60 H.P. new section haulage road served the two working sections. Both the haulage roads were worked by 'direct haulages' which were seated on the rise side of the main south level. A double track was laid in the main south level, and there was a single track in the level stone drift connecting the main south level with No. 1 pit. An endless haulage seated in a rise gallery off the main south level used to deal with loaded and empty tubs between the main south level and the pit bottom. All these three haulages, as I have stated, were driven by electricity.

12. *Gassy Mine.*—It is the admitted case of all parties that the mine in question is a gassy one. Dutt, the Manager, stated that he considered Amlabad to be a gassy mine, and, further, that he had noticed gas coming out from coal generally and accumulate in certain areas, and that the accumulation took place when the ventilation was low. And Sarkar, Electrical Inspector of Mines, stated that Amlabad was on the list of gassy mines kept in his office.

Previous records show that, on the 28th February, 1921, there had taken place an explosion when shaft No. 3 of this mine was being sunk. When only 152 feet from the surface, an unexpected ignition of gas occurred in the shaft bottom resulting in the death of thirteen workmen from severe burns. Then, again, on the 30th April of the same year, an explosion occurred in shaft No. 2—then 182 feet deep—which destroyed the steel Head Gear. The explosion took place during blasting operations, and this must have released a large volume of gas. The Manager admitted that even at the time of his giving evidence (7th April, 1955) the accumulation of gas persisted near the sand stowing barricades in the main south level; and that some stoppings would have to be repaired to disperse the gas, these stoppings being, one at the back of the endless haulage and two in the main south level cross-cut section. He explained that temporary stoppings have been made but that permanent stoppings will have to be made for dispersing the gas.

13. *Safety Lamps.*—As the seams are gassy, safety lamps have been used in the mine from the very beginning. 481 approved flame safety lamps of Haydocks type and 6 of Davis type are in stock. About 50 lamps have magnetic locks, and the rest have arrangements for lead rivet locks.

14. *Ventilation.*—The intake air used to enter the main south level by two roadways—the endless haulage drift and the travelling road on the east side of the haulage drift. The return air from the south district passed through another drift on the west side of the haulage drift. There are only three connections between the pit and the south district through faulted ground.

The mine is mechanically ventilated by an electrically driven double inlet Sirocco fan 7 feet in diameter and producing 1,44,000 cubic feet of air per minute at a water gauge of 7/8 inch. The fan is installed at the top of No. 2 shaft which is upcast. Nos. 1 and 3 shafts are both downcasts. The fan serves the purpose of sucking out air from the mine. It is an exhaust fan, ventilating the whole mine.

The Manager has said that, to prevent any possible break down—apart from the main fan which is run by electric motor—there is also a stand-by motor, and, for the break down of electricity, there is a diesel set for generating current, —at is, motive power.

The intake of air into the south district is from pit No. 1. Some fifteen years ago, the intake was through what is now called the travelling road. About that time, a drift was made through the stone from near No. 1 pit-bottom through the 89-foot fault, and both the intakes, that is, the travelling road in coal and the drift through the stone, meet at the junction of the main south level. The drift was made not only for the purpose of haulage but also for increasing the ventilation, as is the evidence of the Manager.

Apart from the main ventilating fan on the surface, there was another fan down below the pit—coming down from Macneill's time—and it was in a part of the district where the accident took place. It was later shifted from that district to a place where a new area was opened out for being worked. It had been formerly behind the endless haulage, and, from that spot, it was removed to the dip side, about 200 to 300 feet away. It was removed because, when first installed, it was meant to ventilate a large area in the rise, and, as that rise area had exhausted, the working left over in that part was very much limited and the ventilation for this small area was considered sufficient without that fan. The removal was in the beginning of October, 1954. The fan is still there. It now ventilates a small area, known as mid section, in the same district.

15. *Air Measurements.*—The latest entries in the Air Measurement Book kept under Regulation 122, which was seized, pertain to measurements taken in the month of January, 1955. According to these measurements, the total quantity of intake air entering the main south level was 30,000 cubic feet per minute. This air was divided into three splits. The quantity of air going down the new main dip beneath the air-crossing was measured to be 8,640 cubic feet per minute. The second split was the 60 H.P. main dip haulage, and the quantity going down this haulage road was measured below the empty linc and was found to be 14,400 cubic feet per minute. The third split went along the cross-cut road on the east side of the haulage and ventilated the main south level section, stowed edges and the workings on the rise side of the main south level. No measurement was recorded for the quantity of air in the third split; but it may be calculated by deducting the total quantity of the two splits from the total intake entering the main south level. By this calculation, the quantity of air circulating in the third split works out to be 6,960 cubic feet per minute.

16. *Shot-firing.*—Shot-firing is resorted to in this mine. Permitted explosives are used. The explosives are issued under the authority of the Manager. The shot is fired with the approved shot-firing apparatus which is an electric apparatus. One shot only can be fired at a time by the exploder. Shot-firing had been done even on the date of the accident at about 1 or 1-30 p.m.

### III.—NARRATIVE OF THE EXPLOSION

17. What happened on the fateful day and subsequently has been stated by the Manager as follows. On that day, he had gone down the pit in the morning, and had come up to the surface after midday. He then went to his office, and stayed there till quarter to one. Thereafter, he returned to his bungalow. He came out of his bungalow at 3-30 in the afternoon, and the Assistant Manager, Mr. Chatterjee, was with him at the time. When they came near the office, the Manager noticed some one carrying a stretcher towards the pit-mouth from the dispensary. He enquired what the matter was, and it was reported to him that a roof-fall had occurred in the mine. He immediately went up to the pit-top, and there also it was reported to him that a roof-fall had occurred. He then took his safety lamp and checked up the water guage and the fan as also the evasee. He then went down the mine. This might have been at about quarter to four. The Assistant Manager also went down with him. Some tandel coolies were also with him. Having gone down, he asked the on-setter who was on duty as to what had happened, and the report then given to him was that a sort of air-blast had come from the south district. Having asked the Assistant Manager to withdraw all the men from the west and the east districts and to cut off the electric connection, he proceeded to the south district through the stone-drift. About half way, there is a line known as Mochi Line and shown in the working plan\* (exhibit 4) as X and Y. There he heard a groaning sound coming from a place ahead. He proceeded towards that place and found one person in sitting position just in the middle of the track. This man was Bande Ali, the sole survivor. He had injuries but he survived. The Manager, however, knowing that a stretcher was following him, passed on. He had just only asked the man who he was; but he received no reply. Thereafter, he found another person lying on the side of the drain. This man was Santu Rajwar who died later.

Further ahead he met S. B. Misser and R. N. Banerji, the two inchrages. He enquired of them about the accident, and they told him that a very big roof-fall had been taken place in the main south level. The Manager then saw a train of tubs. He found the air-crossing damaged, and the damaged air-crossing had already fallen on the tubs. It was after he had passed through the air-crossing, that he realised that it was a case of explosion. Those tubs were all loaded. There was only a small space left between the wall and the tubs. He said that he checked up for gas but did not find any gas there. Having proceeded

\*Not printed.

for about 15 feet further, he checked up for gas again. There he found gas to be about 3 per cent. He also found that the air-crossing was leaking very badly. He asked the incharges to bring some bamboo mattings to stop the leakage. Bamboo mattings were brought, and the leakage was stopped. He withdrew all men from that place and returned to the Mochi Line. He met the Assistant Manager who was coming from the pit-bottom side. He asked the Assistant Manager to go up and send messages to the Agent of the mine, the Chief Inspector of Mines and the Rescue Brigade. Brattices were erected to prevent the leakage which had resulted from the explosion, as the brick stoppings had been blown away, and brattices had to be put up to stop the leakage. He returned to the surface asking the incharges not to proceed further and to prevent further leakage by putting in brattices.

#### IV.—RESCUE OPERATIONS

18. On the surface, he met the Assistant Manager in front of the workshop gate. The Assistant Manager reported to him that he had already informed the Rescue Brigade, and that information had also been sent to the Agent and the Chief Inspector of Mines. The Manager went to the office, and himself telephoned to the Rescue Station. He was informed that the Rescue Brigade had already left for the colliery. He tried to contact the Chief Inspector of Mines three times; but each time he found the number engaged. He got the connection at the fourth time. He then saw the Agent coming. He asked the Agent to request the Chief Inspector of Mines to come down at once. He said that, as he wanted to go down the mine again, he made over the receiver to the Agent to talk to the Chief Inspector.

The Manager then went down the mine. He continued the work of putting the brattices up to the new section haulage line. There he met S. N. Mukherjee and Lawrence, both Coal Mines Managers from Bhowra. A few minutes later, he met Mr. Jabbi, the Deputy Chief Inspector of Mines, along with some other officials as also Mr. B. M. Chatterji, Manager of Putki. Work was then continued under the direction of the Deputy Chief Inspector of Mines. Then the Rescue Brigade arrived, and they proceeded with the rescue work. The rescue operations continued till 2 A.M. The Chief Inspector of Mines had also arrived. He had received the information at 5 P.M., and reached the mine at about 6 P.M.

The Manager came up on the surface at 2-25 A.M. He went down the pit again after 9 A.M. on the following morning. The Inspectorate staff, the Rescue Brigade and the officials of the mine, including himself, continued the rescue operations. The rescue operations continued almost the whole day and night. The details of the rescue operations will be found in Appendix III.

On the evening of February 5, 1955, the first rescue team had gone inside the mine in three spells: they located 13 dead bodies with burns on them near the main south level in the first spell, 6 dead bodies with severe burns in the rise district in the second spell, and 21 dead bodies towards the dip area near the 60 H.P. haulage brow. All the dead bodies were brought to the surface on February 6th 1955, in the evening.

On the evening of February 7th, 1955, 9 dead bodies were found floating in water in the sump and were brought up on the surface.

On February 10th, 1955, the dead body of Hemanga Singh was found under the debris near the endless haulage.

On February 29th, 1955, the dead body of Tapeswar Rewani was discovered in the water-logged companion dip.

On the evening of February 5th, 1955, Santu Rajwar was brought out of the mine in an injured condition. He died in the hospital.

The above figures show that 52 men had died.

Some dead bodies were covered with coal dust. On the person of one dead body—of Khelu Mahto—when brought on the surface, some biris are said to have been found by the police in his pocket. His dead body was found lying at a distance of about 400 to 500 feet from the area where the explosion took place.

The positions of the dead bodies of the victims are shown on the attached plan prepared by the surveyors of the Department along with the Colliery's surveyors (Appendix IV)\*.

\*Not printed.

A note giving factual statement of observations and the rescue work underground has been submitted by Shri G. S. Jabbi, the Deputy Chief Inspector of Mines. This note covered the period from the 5th February to the 4th March, 1955, the day on which the Court of Inquiry first visited the site of the occurrence. The note has been kept with the record.

19. *Paucity of underground workers on the date of the accident.*—The 5th of February, 1955, was the date of the visit of the States Reorganisation Commission, commonly known as the Boundary Commission, and the attendance of the miners on that date was not normal, as the Agent has stated, and the Manager has also admitted that some essential hands had not gone underground that day, and, by 'essential hands', he meant the pump khalasis, haulage khalasis and some trammers. The Agent said that about 60 men had gone down to work on that day in the south district which is the affected area. Indeed, the Agent explained that, at about 9-30 A.M., he had been informed at his office at Bhowra, which is about 2 miles from the Amlabad Colliery, that the mine was not working, because most of the people had gone to take part in the demonstration before the Boundary Commission. The attendance was, therefore, thin. The mine, of course, was not closed.

245 minors had gone underground in the morning shift (8 A.M. to 4 P.M.) on the 5th February, 1955, the day of the accident. 193 persons returned to the surface, and 52 persons were killed. The medical report is that their death was by suffocation. There can be doubt that this was as a result of a firedamp explosion.

#### V—CIRCUMSTANCES ATTENDING THE ACCIDENT

20. *The Rise Area Section.*—I now proceed to deal with the circumstances attending the accident. I have indicated that the affected area, that is to say, the place where the explosion took place, is the area known as the rise area. It is the case of the Labour as also of the Department of Mines that this portion was an abandoned area, and had been such since about twenty years, so that the present Management ought not to have worked it. The case put forward for the Labour and the Department is, therefore, that the Management were trying to obtain cheap coal from that area whenever they could find an occasion so to do. On the other hand, the case for the Management is that this area was not an abandoned area and that regular working used to be done, even prior to the date of their taking over from Messrs Macneill Barry & Co. on the 1st January, 1955. According to the Management, this area was being worked at least since four months or so before their taking over, that is to say, since the month of November, 1954. The Manager of the Amlabad Colliery, K. Dutt, the second witness for the Management, made the definite statement that this area had started to be worked from November, 1954, and that was the period when Macneill Barry & Co. were the owners of the colliery.

In view of this evidence, it was considered necessary to examine some officers of the time of Macneill Barry & Co., and these witnesses were called by the Court.

In the time of Macneill Barry & Co., the Superintendent of this colliery was William Mitchel Burch, and he was called as the first witness for the Court. He gave evidence that a new area would not be worked in any colliery under Macneill Barry & Co. without the previous sanction of the Superintendent of the Collieries, and, when questioned regarding the rise area, he said: "I never gave any sanction to work any part immediately to the rise side of the main south level endless haulage road. To my knowledge, no working was done in that area in my time, what is to say, till the time that Messrs Macneill Barry sold the colliery to Messrs Karam Chand Thapar." When he was questioned as to whether there was any special reason why that affected area was not worked in his time, he gave the answer that there was no special reason but he thought that the reason was that the area was too small to work. Now some galleries had already been made in this area, and they had been made even before the time of Messrs Macneill Barry & Co. Their predecessors were Messrs Mackinnon Mackenzie & Co. But thereafter the area was left unworked. In respect of these galleries, Burch said: "Some galleries in the affected area, referred to by me above, had been made by my predecessors, that is, when the colliery was under the management of Messrs Mackinnon Mackenzie & Co. Ltd., but thereafter the area was left unworked. I cannot say why it was left unworked. In my time, the area was also left unworked, and I did not work it because it was too small an area to be economically worth working, having regard to the fact that arrangement for tram line, haulage and ventilation would have to be made." It seems to be clear enough that one of the important arrangements which was required for the working of that area was adequate ventilation. Indeed, Burch went on to say: "I say this by guess that Mackinnon Mackenzie & Co. may not have worked this area because they may have had trouble in ventilation, as the



area is adjacent to a fault, the possibility of the presence of gas occurring." It will appear from the plan (exhibit M—1\*) that two galleries were made in this area (marked I and II on the plan, exhibit M—1); one of them led to a fault and the other to what was called jhama. Then the mouths of both these galleries were walled up to a distance of about two feet from the roof. It seems apparent, upon the evidence of Burch, that, the area being adjacent to a fault, the presence of gas could not be ruled out, and a space of about two feet was left between the roof and the wall, so that gas may not bopped up inside the galleries which might have been a source of greater danger in that area. It is equally apparent that, for want of adequate ventilation, work in that area was abandoned.

W. J. Wright, the second witness for the Court, was the Agent of the Amlabad Colliery from the middle of May, 1953, till the end of 1954, and Burch was the Superintendent from April, 1954, till December, 1954. This was the time when the colliery was owned by Messrs Macneill Barry & Co., Wright too stated that the area which has been referred to in the above paragraph and which is immediately to the rise side of the main south level endless haulage road was not worked out in his time, and that no sanction, either orally or in writing, had been given by the then Superintendent to work that area.

From the evidence of Burch and Wright, it seems to be abundantly clear that galleries had been driven in this affected area, and some working had been done during the time of Messrs Mackinnon Mackenzie & Co., but no further working was continued during the period of their successors, namely, Messrs Macneill Barry & Co. It would appear that, after driving the galleries marked as heading I and II on the plan (exhibit M—3\*) in that rise area, no development work had been done, and the two galleries had been barricaded by the construction of brick walls or stoppings, only two feet short of the roof. It was evidently not considered useful or safe to go ahead with further workings there. When, however, Messrs Karam Chand Thapar & Bros. Ltd. took over the colliery, work was resumed.

The present Manager, K. Dutt, made the admission that this rise section had not been worked for the last twenty years but he did not clearly say why it had been not so worked. When he was questioned as to whether it had ever occurred to him why it had not been worked, he answered: "Because I was reported that they (the predecessors of Messrs Karam Chand Thapar & Bros.) wanted to develop the dip section more quickly up to the boundaries." He also said that there was a 89-foot fault on the rise section. Work, however, commenced in this area in the time of the present Management. Surajballi Missir, the fourth witness for the Management and an underground incharge, was questioned about the walls, which were called the stoppings, and which had been erected at the mouths of the two galleries in this rise area. The witness said that he did not know how long ago these two stoppings had been built, nor did he know why they had been made; but he admitted that they had been in existence even before he started to work in the south district 6 or 7 years ago. He then stated: "Before the stopping was broken, we had the suspicion that there may be accumulation of gas on the further northern side of it (that is to say, within the gallery), and so gas was first tested and then the two stoppings were broken." According to him, the two stoppings had been removed at the instance of the Manager, K. Dutt. Then the same witness said: "After removal of the stoppings, we noticed that the galleries had been driven up to the fault." I have indicated that presence of gas here was very probable. The witness then proceeded thus: "After the two stoppings were broken no work was done in the two galleries further north of that point; but at the mouth the two galleries were widened to some extent under the orders of the Manager. After removing these two stoppings, no work was done near about those places. Work near about the places where the two stoppings were broken was taken up after 2½ or 3 months. After the stoppings were broken, work was started about 50 feet south of the stopping in No. 1 gallery, and then a gallery was driven towards the north-west." The witness further described a new drivage which had been made in the time of the present Management. He said: "The whole of the drivage shown in the map, exhibit M—1\*, as L was made after removal of the stoppings I and II. After, that work was over, work was started and the gallery south of the block (galleries I and II) was widened. After that, the area south of the stopping in gallery shown as No. II was being widened, and it was at this time that the explosion took place. Men were actually working in that portion at that time. "Indeed, in this area, even solid blasting had been done, for Surajballi Missir said. "As far as I know, solid blasting was not done; but, on examination of the holes, it appears that solid blasting had been done." When further questioned about these holes, he said; "Those holes about which I have just spoken were apparently made by drillers of their own accord and not at my instance. I had seen those holes about a fortnight before the date of the explosion. I had

\*Not printed.

asked the driller why he had made such holes, and he said that he had done so by mistake. I have made a report to the Manager orally about these holes having been so made by the driller. I do not know if the Manager took any action on my report. Those holes were in galleries marked W and W-2, on the plan M—1\*. No work was done in galleries W and W-2 on the date of the explosion. Some work was done in those galleries about 2 days prior to the date of the explosion." Sharma, the Agent, was questioned, and he denied all knowledge of the use of explosives in W and W-2 and, when pressed further, said, "There are remnants of shot-holes existing in those two galleries W and W-2. It seems that explosives had been used but not to my knowledge." I cannot believe that those holes had been drilled without the sanction of the appropriate authorities. It is quite clear that work was being done, and even shot-firing had been resorted to. This area had apparently been abandoned for some twenty years, and obviously for the reason that gas in dangerous quantity might accumulate. The work even during the time of the present Management in this area, as I read the evidence of Surajballi Missir, was not a regular one but irregular. It seems that, whenever opportunity offered itself, coal was extracted. Surajballi Missir admitted that it was only when the miners were excessive in number that they used to be sent to this area, and that, when the miners were not excessive, then only two districts, namely, main dip section and mid section, used to be worked. The witness described the procedure in these words: "First, miners used to be sent to the main dip section and the mid section to work. If there were more miners available, they used to be sent to work in the rise section." And, with regard to the day of the accident, he said: "On the day of the accident, the miners were not excessive; on the other hand, they were less in number than on other working days, and yet work was done in the rise section because there was shortage of trammers." And he further said: "Coal is more easily available in the rise section by side blasting and roof blasting than in the other two districts." The Manager had said that about 100 men worked in the south district in each shift but not more than 20 used to work in the endless rise area.

21. I am constrained to draw the conclusion that this particular area had been left almost as an abandoned area, and, when the present Management took over, it was thought that coal may be extracted therefrom at irregular intervals, whenever an opportunity offered itself so to do. I am not prepared to accept the evidence given on behalf of the Management that this area was being worked since November, 1954, that is, since the time of the predecessors of the present Management. I have stated already that the present Management took over on the 1st January, 1955, and the explosion took place on the 5th February, 1955. A question was mooted whether the part of the area now shown as having been worked could have been worked within this period; but Burch, the first witness for the Court, said that these workings could be done by pick-mining within a month or less.

It was strongly contended on behalf of the Management that the evidence of Burch and Wright must not be accepted as true. These witnesses were characterised as being partisan, as giving evidence with jaundiced eye, and as attempting to save their masters under whom they had served as also themselves. I cannot accede to these suggestions. In my opinion, these witnesses are independent, and their evidence is straightforward, and I am not able to say that they are not truthful. Reliance was placed by the Management on certain reports submitted by the Agent to the Head Office and by the Manager to the Managing Agents (exhibits C series) in support of the argument that each time no gas was detected, and that coal-raising was done in that particular area. Suffice it to say that in not one of these reports is it stated that coal-raising was done from the rise area; merely to describe the area as the main south level is not, in view of the definite evidence to the contrary, enough to conclude that the rise area is included within that description.

The above conclusion is fortified by other circumstances. The working plan (exhibit M—3\*) is on the record. So is the ventilation plan (exhibit 4\*). The date of the last survey is given in the working plan as the 4th January, 1955. The rise area in question has been marked on both the plans, encircled in red: in the former, the place is marked A and on the latter XX. It is the definite evidence of both Burch and Wright that that area had not been worked in their time; and, indeed, no working is at all shown in that area on the working plan: this is admitted. The area is north-west side of No. 1 rise off the main south level. The conclusion is irresistible that that area had not been worked up till 4th January, 1955. The present Management took over on the 1st January, 1955. We find now that the area has been worked and working was in progress therein even on the day of the accident. Whatever working has been done must necessarily have been done after the 4th January, 1955. A plan on an enlarged scale (exhibit M—1\*) has been prepared by the surveyor of the Department of

\*Not printed.

Mines with the help of the surveyor of the colliery. The gallery marked G in the plan, exhibit M—1\*, is not to be found in the working plan, exhibit M—3\*, nor the driveage marked L—2 on the plan M—1. All this is admitted in the evidence of the Manager. This extra working was, therefore, done after the 4th January, 1955.

There is no record to show that air measurement was ever taken in this area. If this area was a regular working place, air measurement, under the Regulations, was bound to have been taken. Then there is no record as to what were the raisings from this particular area. And then there is no record of the daily inspections made in this area by the Manager. The Manager admitted in his evidence that there was no separate underground inspection report book maintained particularly for this area which he called the endless rise section; but he explained that this area was included within the area known as the new section, namely, the west cross-cut section. Admittedly, therefore, there is no record of any inspection of the endless rise section particularly, but he said that it is included in the west cross-cut section, so that the inspection of the latter section would include the inspection of the former. Similarly, the Manager explained with regard to the raisings. He admitted that the daily raising report book would not show the raising from the endless rise section specifically or separately, but he said that the raising from this section was included in the raising of the new section which is mentioned in the daily raising report book. Accordingly, for purposes of underground inspection as also for the raisings, the rise section is included within the new section, also known as the west cross-cut section. When further questioned, the Manager made the statements: "There is no separate note in that register (meaning the daily raising report book, exhibit C\*) to show that the raising from the endless rise section is included in the new section." And then again: "Similarly, there is no note in the daily inspection report book that the endless rise section is included in the new section. It is so because it is inspected by the same sirdar." The Manager asserted that he could prove by reference to the munshis' report that the endless rise section is included in the new section, and he did definitely assert that there was no other document in the colliery to prove that fact. When confronted with the munshis' report, he said that the raisings from the endless rise are included within the raisings from the main south level rise; but he again admitted that it was not stated anywhere in the reports about the raisings from the endless rise section at all. This evidence is wholly unsatisfactory. Upon the evidence, it appears that the endless rise area was not a place of regular working.

Admittedly, Amlabad is a gassy mine. It is also admitted that gas is given out from the seams, and in such a mine it is not safe to drive a gallery for a distance of more than ten feet, as gas is likely to get accumulated in it, and, as Surajballi Missir, the fourth witness for the Management, admitted, "If such a gallery happens to be in the vicinity of a fault, then the chances of accumulation of gas are all the more". And he also said that, if the gallery happens to be going towards the rise side, the chances of accumulation of gas are increased. The Manager, K. Dutt, has also admitted that, in the Amlabad mine, gas is constantly being emitted from the strata or, in other words, it is constantly bleeding from the strata. By reason of these circumstances, I am constrained to find that the endless rise area was a dangerous area to work in unless there was adequate ventilation to clear the gas.

While I am on this subject, I cannot but make a reference to a note made by the Manager himself in his personal diary (exhibit 3\*) regarding the explosion on the 5th February, 1955. That note is in these words:—

"The mine is running with a very few men. Went to the East Dist. and then to the pit bottom for arranging the supplies. An explosion took place at about 3 p.m. A gas explosion took place at the rise of main south level. X X X X X X X X Missir engaged some miners in the rise section and God only knows how the explosion took place though the place I last inspected was absolutely free from gas and any trouble. Nearly 55 persons have been involved and not yet been determined how many are dead. I think all of them will be dead by C O poisoning. It is very distressing for me to see them as I know practically all of them and worked side by side for the last two years. I greatly feel for them and their families. I might have been among them. I came out of the mine only at 12 O'clock or after in the noon".

The eight crosses in the quotation are mine, and they indicate that eight words there have been so obliterated that it is difficult to decipher them, probably just before producing the diary in Court. The first four words, however, can be deciphered as having been "In spite of my repeated", and the fifth perhaps

"orders", but the remaining three cannot be deciphered, and the Manager, when in the witness-box, rendered no help to decipher them. The note says that he did not want men to work in that rise area, and he felt unhappy at the thought that workmen had been sent there that day. It is noteworthy that, in spite of the orders of the Manager to the contrary, Missir, a subordinate of his, had sent men to work in that area that day. It was suggested on behalf of the Labour that the proprietors had appointed one S. K. Khosla as the General Supervisor of the colliery, and there are indications that, through he is stated to be below in rank to the Manager, he was, in fact, not in that position. It does not appear from the note quoted above that the Manager had visited the south district that morning. He noted about the east district only. And I do not think that he had gone to the south district, for, had he done so, he may possibly have withdrawn the men therefrom. It does not seem to have been a regularly worked area. But the blame must lie upon the Manager either for his failure to visit that area that day or, if he did so, for his failure to withdraw the men from it, in the context of his diary. Then, again, although it is stated that there was no gas when he last visited, there is no entry to show that any air measurement was ever recorded for that area. It will appear, however, from the air measurement book (exhibit 2\*) that in the month of November, 1954, the total quantity of intake air was 33,800 cubic feet per minute, and, in December, 1954, it was 34,000 cubic feet per minute; whereas in January, 1955, it was 30,000 cubic feet per minute. The intake air was much more, in November and December, 1954, and this may well account for not finding gas then; but, as will appear from the next paragraph of the report, the position was wholly different on the 5th February, 1955, the day of the accident. I may mention here that the Manager has stated in his evidence that even on the previous day (4th February, 1955) miners had been working at that place; but he does not seem to have raised any objection then and allowed the work to go on in that very same area: to express regret for the dead after the explosion, having taken no precaution previous to it, is not seemly.

On the 5th February, 1955, there seems to have been some dislocation in the working of this mine. I have already indicated that that was the day of the visit of the States Reorganisation Commission in Dhanbad, and a number of miners had not gone down the mine that day to work. There was shortage of hands that day, and, I believe, there was inadequacy of ventilation in the mine on that day as well (I shall deal with the subject of ventilation presently). There was shortage of labour inside the mine, and in spite of that, contrary to the practice of sending miners in this area to work when their number was excessive, miners were sent to this area to work that day. The great probability of an attempt at getting cheap coal on that day with the assistance of only a few miners, in spite of low ventilation and in spite of dangers, cannot be excluded.

**22. Derangement of Ventilation.**—I then come to the question of ventilation as found on the day of the occurrence in this mine. In the earlier part of my report, I have stated that the mine is mechanically ventilated by an electrically driven double inlet Sirocco fan installed on the surface. The capacity for displacement of air by this fan is 1,80,000 cubic feet per minute; but, as admitted by the Manager, the actual displacement of air is 1,44,000 cubic feet per minute. The intake of air into the south district, wherein the explosion took place, is from pit No. 1. Some 15 years ago, the intake was through what is now called the travelling road, and, at about that time, a drift was made through the stone from near No. 1 pit-bottom through the 89-foot fault. Both the intakes, that is, the travelling road in coal and the drift through the stone, meet at a particular junction of the main south level. The drift is also known as the endless haulage drift. The intake of air enters the main south level by both these roadways. The return air from the south district passes through another drift on the west side of the haulage drift. Now, the latest entry in the air measurement book (exhibit 2\*) kept under Regulation 122 of the Indian Coal Mines Regulations, 1926, shows that the total quantity of intake air entering the main south level was 30,000 cubic feet per minute. This was in the month of January, 1955. There is no entry for the month of February, 1955. When I say that the last entry is for the month of January, 1955, I should add that it means, according to the evidence of the Manager, within the first fortnight of January, 1955, as he said that no air measurement was taken between the second week of January, 1955, and the date of the explosion. Now, this air was divided into three splits called the new main dip (the first split), the main dip haulage (the second split) and the main south level rise section (the third split). The quantity of air going down the new main dip (the first split) beneath the air-crossing was 8,640 cubic feet per minute, and the quantity of air going down the main dip haulage (the second split) was found to be 14,400 cubic feet per minute. No measurement was recorded for the quantity of air going to the third

\* Not printed.

split, the main south level rise section. The Assistant Manager, N. K. Chatterjee, witness No. 7 for the Management, admitted that he had not recorded any air measurement regarding the third split, and he said: "I can give no reason for that omission."; but he added that he had taken air measurement for that third split, though he had not recorded it. Thus, there is no record of the quantity of air ventilating the third split. This was a violation of Regulation 122 of the Coal Mines Regulations. This regulation clearly enjoins the recording in a book, which in this case is called the air measurement book, the quantity of air, at least, once in every month, measured in every split. This was not done, and this omission is a clear violation of this regulation.

23. The workings of the main south level section as also those of the rise side of the main south level would be ventilated by the quantity of air going into the third split. Since no measurement was recorded in respect of the third split, calculating it by deducting the total quantity of air going into the other two splits ( $8,640 + 14,400 = 23,040$ ) from the total intake (30,000) entering the main south level, the quantity of air circulating in the third split works out to be 6,960 cubic feet per minute. It was this quantity of air which would be ventilating the main south level section as also the rise section which is the affected area and where the explosion took place. According to the evidence of the Deputy Chief Inspector of Mines, G. S. Jabbi, the first witness for the Department, 6,960 cubic feet of air per minute was not adequate to ventilate that area, as he had found after the explosion by actual measurement that about 13,000 cubic feet of air per minute was sufficient just to clear the gas in the general body of the air. The Assistant Manager, N. K. Chatterjee, witness No. 7 for the Management, gave his opinion that, if 12,000 cubic feet of air circulated in the third split, the ventilation would be adequate; but, if the quantity of air be reduced below 5,000 to 6,000, then the ventilation would be inadequate, and gas may make its appearance.

24. *The door behind the Endless Haulage.*—From a further consideration of the circumstances, it appears that factually only about half of 6,960 cubic feet of air per minute was passing through the third split into the endless rise area, that is to say, the affected area, which quantity was undoubtedly wholly insufficient to ventilate that part of the mine. The reason why I say so is that almost half of the quantity of air (6,960) was being short-circuited. In order to reach the third split, the air would have to travel along the intake airway passing by the endless haulage. There was a door behind the endless haulage. If the door behind the endless haulage be kept shut, the air would pass along in its ordinary course. On the other hand, if that door be left open, some quantity of air will short-circuit through that door, with the result that that quantity of air will not be reaching the third split. According to the Manager, the measurement of this door was  $4' \times 3\frac{1}{2}'$ , while according to Surajballi Missir, the underground in-charge, it measured  $4\frac{1}{2}' \times 3\frac{1}{2}'$  and it has been marked on the plan, exhibit M-3, at a place called stopping No. 3. The Manager has admitted that, if this door be kept open, about 3,000 to 4,000 cubic feet of air per minute will be short-circuited from the Main south level towards the return through that door. In that case, the quantity of air reaching the third split would be 6,960 minus 3,000 or 4,000, and, if we deduct roughly 3,500 from 6,960, it will be found that the quantity of air reaching the third split would be as little as 3,460 cubic feet per minute. This quantity is far below the adequate quantity. To quote the evidence of Whitaker (witness No. 6 for the Court), who was examined as an expert on ventilation, "If the door behind the endless haulage be left open, the quantity of air circulating in the area south-east of that door will be considerably decreased and may result in a serious derangement of ventilation in that area"; and then again: "If the ventilation is deranged, inflammable gas may accumulate, and this may happen particularly in the rise workings or in pockets in the roof and in the return air"; and further: "I agree that, when the door is kept open, the gas would tend to accumulate in the area to the south east of that door behind the endless haulage." Whitaker had made an experiment while he was inspecting the mine. The original door, the measurement of which I have given above, was blown out as a result of the explosion, and it was lying some feet away from its position. In order to improve the ventilation after the explosion, a new door had been constructed which was of a much smaller size. Whitaker experimented by taking the air measurement with this new door shut and then open, and in this respect he deposed as follows:—

"Short-circuiting the air on the inbye side will reduce the air flowing in the roadways and past the haulage motor. Experimentally, we tried the effect of short-circuiting the air using a new door which is now installed, but it was much smaller in area than a door which was found lying in a damaged condition, which is said to have been

the original door. The amount of air passing when the new door was opened was about 5/6th of that when the door was closed. But, with a larger door, the difference should have been much greater and proportionate to the area of the door. In other words, when the door was opened, 1/6th of the air leaks through the door; but with the original larger door this quantity may have been double.

"The area of the old door was apparently double than that of the new door.

"The air leakage through the bigger door, which is said to have been the original door, in the present circumstances, may have been as much as half.

"In those circumstances, the ventilation in that particular district would possibly be below adequate, and, in consequence, the gas could accumulate to explosive proportion."

I may repeat the evidence given on behalf of the Management which would be found in the evidence of the Assistant Manager, N. K. Chatterjee (witness No. 7 for the Management): "If the quantity be reduced below five to six thousand then the ventilation would be inadequate, and gas may make its appearance." S. C. Ghosh (witness No. 7 for the Court), Superintendent of Collieries, Tata Iron and Steel Co., who had also gone down the mine for inspection, is of the same opinion that there was short-circuiting of air through the door behind the endless haulage. In this state of the evidence, the only conclusion at which I can arrive is that, if the door behind the endless haulage was being kept open, there was bound to be a serious derangement in the ventilation in a part of the affected area.

25. The next question then which must follow is whether that door behind the endless haulage was, in fact, being kept open on that fateful day. Admittedly, miners were engaged working in that rise area on the day of the accident, and they were killed as a result of the explosion. On the previous day also, on the 4th February, 1955, that particular portion was being worked. The Manager stated that, on the morning of the 4th February, 1955, five or six persons were doing pick-mining at a place marked W on the plan, exhibit M-3\*, and that some workmen were also loading some fallen coal in the gallery marked W-1 on the same plan. At the latter place, there were two or three such persons. On the 5th February, 1955, also, miners were working and loading coal. After the explosion, six dead bodies were found near W-1 on the same day. The Manager has admitted that, on the 5th February, 1955, miners were engaged in loading coal. The following question was put to the Manager: "When loading of coal is in progress from the rise side to the main south level where the tubs are provided, will not the door be necessarily kept open". The witness gave the answer: No, because the door closes automatically and also because there are men to see that the door is kept shut." When questioned as to whether there was any door attendant to see that the door is kept shut, he said: "There is no door attendant for this door as it is not necessary," and he further said: "There was no man designated as door attendant kept at the door in stopping No. 3 before the explosion in order to see that it is always kept shut, except when a man passes through it. But men on hazri and the haulage khalasi were instructed to see that it is all the time kept closed." The Manager further said: "There was a man kept at the door in stopping No. 3 to see that the door was kept shut, although that man had not designated for the purposes of this piece of duty." He had already made the admission that there was no man to attend to this door in order to see that it is kept shut. When the Manager was questioned as to what was the name of the man who was put to attend to this door on the date of the explosion, he said that he did not know the name. Surajballi Missir (witness No. 4 for the Management) said that no labourer is specifically appointed by the authorities for looking after this door, but he explained that the incharges and the sirdars depute one labourer on hazri for looking after that door, and the matter is reported to the Manager. He named one Dhaneshwar, one of the men killed, as having been the attendant at the door on that day. But another witness examined for the Management, Bande Ali Mian (witness No. 3 for the Management), made the following statements: "The loaders were bringing out the coal from the rise gallery behind the endless haulage. There is a door behind the endless haulage, and the loaders were bringing the coal out of this door.... I did not see anybody near the door through which loading was being done. I do not know if any person was deputed to attend to the door." Bande Ali Mian had been injured in the explosion; but he survived. Had there been any man deputed to attend to this door in order to see that it is kept shut, Bande Ali Mian was bound to have seen him. According to the evidence of Surajballi Missir, the loaders, when coming out of this door, used to carry loaded baskets on their shoulders. It does seem to me that, in order to facilitate the loading, the miners for their convenience, would keep the door open as they were carrying

\*Not printed.

loaded baskets on their shoulders, and it would be most unlikely that each of the loaders would open the door and shut it after passing through it, leaving the same procedure to be adopted by his followers, especially when, as I think, there was no door attendant to see that the door is kept shut, and for the further reason that, through that door, air was short-circuiting, and, at that place, the loaders would be getting fresh air, and that would be another temptation for them to keep the door open rather than shut it each time one of them passed through it. It must be borne in mind that coal cutting and loading was in progress in the affected area in the morning shift when the explosion took place. There had been shot-firing as well. The shot-firing was completed by 1 or 1.30 p. m. A considerable amount of coal was found lying at this spot by the Deputy Chief Inspector of Mines when he inspected that spot after the explosion. Thus, between 1.30 p.m. and 3 p. m. (the approximate time of the explosion), loading must have been at its peak. Shot-firing having been finished and a considerable heap of coal having been collected, loading was the next process. To make the work of loading easier, this door was left open resulting in derangement of ventilation and accumulation of gas, since gas was constantly bleeding from the strata. And, from what I have shown above, it would appear that this place had been almost an abandoned spot, as there was a likelihood of accumulation of gas in dangerous quantity. By keeping the door open, some intake air passed through this door, and when to the return side, with the result that the quantity of fresh air going along the main south level beyond the endless haulage and along the edges of the stowed area decreased and caused bad ventilation therein. It was argued that the door had been in existence for some time and workers had been coming out through it, as that was the only exit to the endless haulage line, then how is it, so it was put, that no accumulation of gas had taken place before the fateful day? The answer seems to be obvious that on other days, according to the evidence of the Manager, there used to be a door attendant, but on the fateful day, as is apparent from the evidence of Bande Ali Mian, there was none. And, admittedly, there was paucity of workers on that day. Thus came the unfortunate event.

26. An ingenious argument was raised to the effect that, supposing the door behind the endless haulage had been kept open, it would become a new additional split in that line, and, as a consequence of this additional split, there will be an increase in the quantity of the air in the main south level, and no question of a derangement of ventilation can arise. The total quantity of air entering the intake airway of a mine may be increased by the addition of a new split; but there would be no justification to assume that this would necessarily result in an increase in the quantity of air passing through the splits which had been in existence since before the additional split. The greater likelihood, on the other hand, would be that the quantity of air circulating through the previously-existing splits would be reduced. We have been provided no data regarding the sectional dimensions of the intake and return airways; nor is there any record of the pressure gauge readings from which some definite conclusions may possibly have been arrived at. The experiments made by Dr. Whitaker on this point reveal that there would be a starvation in the previously-existing splits, and there is no reason why his experimental results should not be accepted. With regard to the air escaping through the door behind the endless haulage, we have the very definite evidence of Whitaker, who experimentally tried the effect of short-circuiting the air through the door now in existence, and the result which he found was that the amount of air passing when this door was opened was about 5/6th of that when the door was closed. At the time of the accident, the door was a much larger one, and with this larger door open, the quantity of leakage may have been as much as half. Having such clear evidence before us—given after practical experiment—I would not base my conclusion upon the mere assumption that the supposed leakage of air through this door would, in fact, amount to a new split, thus increasing—instead of decreasing—the quantity of air in the main south level. I have no hesitation in holding that such a leakage was likely to—and, in fact, did—cause derangement in the ventilation.

27. Yet another attempt was made to increase the quantity of air going into the rise area by saying that a further quantity of air was coursed through what has been called the second split (that is, the main dip haulage intake air at the seventh level of the haulage road) alongside the sand-stowed area. Just before reaching the second split, there is what is called Golai line or empty line, and this joins the second split after a short distance. Therefore, some air was going into the Golai line and some into the second split itself. At the junction of the two air measurement was taken, and it was 14,400 cubic feet. It was this quantity which was said to be passing ultimately into the second split. Another air measurement at a place below the seventh level was taken, and this was recorded at 10,170 cubic feet. Thus, the argument for the Management was that it was really 10,170 cubic feet which was going into the second split, and the balance, about 4,000

cubic feet, was going along the seventh level, passing by the sand-stowed area towards the east, and ultimately reaching the rise area on the north. Now, the questions is whether such coursing of the air of the second split into the rise area along that route was possible. I do not think it was. There are stoppings marked on the ventilation plan to indicate that the air could not go that way. It was suggested that those stoppings, though shown as such on the ventilation plan, do not, in fact, exist. But the evidence of the Assistant Manager is to the contrary. He has made the following admissions in respect of these stoppings and an air-crossing which is also shown on the ventilation plan:—

“There is an air-crossing in the main south level about two pillars inbye from the junction of the main south level and the main dip section haulage road. This air-crossing was not in operation for 6 or 7 months before the explosion. There is a stopping shown in the ventilation plan in the rise gallery on the rise side of the old position of this air-crossing. There is also a stopping in the next rise gallery outbye side of this rise gallery.

“There is a stopping also marked in the main south level on the south side of the junction of the main south level and main haulage.

“There is also a door shown in the cross-cut take off from the main south level.”

And then comes the important passage:—

“If the three stoppings and the door actually existed as they are shown in the ventilation plan, the return airway of the seventh level of main dip split could not possibly join with the intake of the cross-cut rise district.”

Thus, the case for the Management that about 4,000 cubic feet of air was going into the affected area from the second split is not supported from the circumstances disclosed.

28. *Auxiliary Fan*—According to the Management, again, although the quantity of air circulating in the third split, according to the air measurement book, would be 6,960 cubic feet per minute, it was, in fact, much more. I have stated, that the figure 6,960 has been arrived at by deducting the quantity of air going into the other two splits (8,640 + 14,400 + 23,040) from the total intake (30,000) entering the main south level. This part of the argument advanced for the Management runs counter to their own records, and belies the entries in the air measurement book, those entries becoming erroneous. Formerly, there was an auxiliary fan in the rise area; but, when depillaring and stowing of the goaf in that area had been completed, that auxiliary fan was removed to the dip side. It appears from the ventilation plan (exhibit 4\*) that the quantity of air going into the first and the second splits had its return journey through this auxiliary fan, and the evidence of the Assistant Manager, Chatterjee, is that this fan was displacing 20,000 cubic feet of air per minute. Hence, the argument placed for the Management was that it was really 20,000 cubic feet of air which was entering the first and the second splits, because this was the quantity of air which was being displaced by the auxiliary fan, and not 23,040 cubic feet per minute as the air measurement book shows. Such being the case, the quantity of air which has to be deducted from the total intake, namely, 30,000, should be 20,000, and not 23,040 cubic feet, with the result that the balance, namely, 10,000 cubic feet of air per minute, was left for the third split. The third split was, therefore, having, according to this calculation, at least 10,000 cubic feet of air per minute, and it was this quantity of air which was going into the rise side, that is, to the affected area. In support of this argument, reference was made to the evidence of the Assistant Manager, Chatterjee, who said that the rated capacity of the fan was 20,000 cubic feet of air per minute, and it could not do more. Therefore, it was this quantity of air, namely, 20,000 cubic feet, which must have been going into the first and the second splits. For this, we have the oral evidence of the Assistant Manager only. According to the Assistant Manager, “the fan was running at a fixed speed, and it could not be changed unless the parts of the machinery are changed.” The question is whether this statement is correct. According to the case of the Department of Mines, this fan could displace more than 20,000 of air per minute, if there was change of pressure. And, for this, the opinion of Dr. Penman in his book called “Principles and Practice of Mine Ventilation” at pages 163 and 164 was cited, and further support was taken from the evidence of Whitaker. Whitaker said as follows:—

“The capacity of a fan at a stipulated speed of rotation is given in terms not only of quantity, i.e., cft. air per minute, but also of pressure

\*Not printed.



difference, i.e., inches of water gauge. The capacity of the fan in question is said to be 20,000 c.ft. per minute at a certain water gauge, say 3 inches. If the circuit on which the fan is drawing does not require 3 inches (say) of water gauge, but only 2 inches or 1 inch to allow 20,000 c. ft. air per minute to pass, then the fan will deliver more air than 20,000 c. ft. per minute—at the stipulated speed of rotation. In other words, if 24,000 c. ft. air per minute were passing (as recorded) the fan is a little on the small side, and is to a small degree throttling the air. But the wastage of power through this is probably not serious."

Indeed, the evidence of the Assistant Manager at another place of his deposition goes counter to his evidence that the fan was running at a fixed speed, and it could not be changed unless the parts of the machinery were changed, with the result that the fan could not displace more than 20,000 cubic feet of air per minute. The return airway measurement of January, 1955, shows that a reading was taken on the main dip section return before the stone drift. The Assistant Manager admitted that "this air has actually come through the fan, and the quantity of air recorded here is 21,930", that is to say, it is about two thousand more than the figure 20,000 which the Assistant Manager has fixed as the maximum quantity of air which could be displaced by the fan. In spite of this evidence, the Assistant Manager persisted in his view that the fan could not circulate more than 20,000 cubic feet of air per minute, as this was its capacity. He was questioned thus: "Can the fan do more than 20,000 cubic feet if the conditions, such as water gauge and pressure, change?", and the answer which he gave was this: "No. It can change only if the speed of the fan changes." Yet the Assistant Manager made admission that the return airway measurement of January, 1955, does show that the fan was displacing 21,930 cubic feet of air per minute. The witness is thus belying the records.

29. It was then submitted on behalf of the Management that the explanation for the record showing 21,930 cubic feet of air passing through the auxiliary fan lies in the fact that the return air expands in volume because it gets hot, and then the volume will be greater. Therefore, the apparent increase of 1,930 cubic feet of air after passing through the fan is due to the increase in volume after it has been heated. Now, the period of time in question was the cold weather, that is, the month of February. Let us suppose that the temperature on the surface was about 70°F, then the mine temperature was bound to be higher. But assuming the mine temperature to be the same, and the temperature at the inlet of the fan as 70°F, then, in order that the volume of 20,000 cubic feet of air at the inlet should become about 22,000 cubic feet at the outlet of the fan, the temperature at the outlet of the fan will have to be about 123°F, that is, a temperature rise of 53° in the fan. This is very unlikely. Therefore, 22,000 cubic feet of air at the outlet will surely mean more than 20,000 cubic feet at the inlet.

30. It seems to me that the quantity of air displaced by the fan will vary by change of pressure, and in this particular case the auxiliary fan was, in fact, displacing more than 20,000 cubic feet per minute. With a decrease in the pressure, the capacity may increase, though at the cost of efficiency. Whitaker, the witness examined as an expert, was questioned about this auxiliary fan, and he gave the following evidence. He stated that, on an examination of the air measurement book, he could find that 6,960 cubic feet of air per minute was circulating in the workings in the rise side of the main south level. And then, with regard to the auxiliary fan, he said: "If an auxiliary fan is installed at a place in the return side of the district in question (main south level goaf area), it would increase the quantity of air circulating in that district." That was the place where the auxiliary fan had been installed originally. But then it had been removed to a place in the dip side. And then Whitaker said: "If the same auxiliary fan is put into the dip side of the main south level and it sucks air from the new cross-cut district, then it will tend to decrease the quantity of air in the affected area." Thus, it was stated by the Department of Mines that the present position of the auxiliary fan would adversely affect the quantity of air going in the rise area where the explosion has taken place. In these circumstances, the case for the Management that the auxiliary fan was displacing 20,000 cubic feet of air per minute, and that, therefore, it was this quantity which was circulating in the first and the second splits leaving 10,000 cubic feet of air per minute to circulate in the third split is not possible of acceptance. But, even if it be supposed that 10,000 cubic feet of air per minute was left for circulation in the third split, that quantity will be reduced by half, if the air be short-circuiting through the door behind the endless rise. I have already found that that door was being left open on the day of the explosion, and that air was short-circuiting. The evidence is that

by reason of this short circuiting; the quantity of air will be reduced by almost half, so that only 5,000 cubic feet of air per minute or so would be left for the third split, and this is admittedly inadequate for ventilating that district. The auxiliary fan, accordingly, in its present position, does not help the Management in making out a case of adequate ventilation in the rise area.

31. All these figures, whether it be 10,000 cubic feet (as stated by the Management) or 6,960 cubic feet (as stated by the Department), take no account of leakages, and leakages admittedly there were. The Assistant Manager has made these admissions: "In order to ventilate the auxiliary fan, there was a hole 6"×6" in the stopping in the level gallery on the south side of the fan, and air is to come down from the main south level and pass through this hole with a view to keeping the place cool." There was a door provided on the dip side of the fan with a view to separating the intake from the return side, and there was leakage through this door to the extent of about 500 cubic feet per minute; there was another door behind the endless haulage, and this door also is between the intake and the return airway; and there was another door, but the Assistant Manager said that the leakage through this door must have been very small. One must make allowances for these leakages. Accordingly, the only conclusion is that the quantity of air available for the third split for ventilating the rise area was exceedingly inadequate, particularly on the day of the accident.

32. *Source of the Firedamp*—I shall now examine the theories propounded at the inquiry by the parties, who have been represented, as to how gas came to accumulate in explosive proportions. The two main theories are (1) the theory, put forward on behalf of the labour organisations and the Department of Mines, that, by reason of a derangement in the ventilation on that day in the circumstances which I have already stated, gas gradually accumulated along the stowed edges and in the endless rise area, which had not been worked for some twenty years or so and which area ought not to have been worked without adequate ventilation, and (2) the theory, put forward on behalf of the Management, namely, that gas came out as a sudden on-rush from the goaf area which had been stowed about the end of December, 1954, by reason of a roof-fall taking place in that goaf above the stowed surface. This goaf area which had been sand-stowed is in the main south level. The quantity of intake air going into the third split would pass by the side of this stowed area and would enter into the endless rise section. This stowed area was emitting gas all the time, and, as explained by the Assistant Manager, "the gas which does come out from the goafed area is swept by the air current which passes by the goafed area, and thereby it gets diluted." Accordingly, if the ventilation be good and adequate, gas coming out of the goafed area would be diluted, and there will be no danger. The Management, accordingly, suggested that it was not a case of accumulation of gas by reason of non-dilution, as a result of bad ventilation, but that gas was emitted from the goafed area suddenly as an on-rush that afternoon, though such a thing had never happened before, and it was wholly unexpected and beyond control.

33. The Agent, Sharma, gave his opinion in these words regarding the accumulation of gas: "In my opinion, the gas had come in rush from the stowed area from the south cross-cut rise section area." That is to say, according to him, the gas had come out of the stowed area, for he explained thus: "In hydraulic sand-stowed area, there is generally shrinkage, and the shrinkage may amount to 5 to 10 per cent, and, if the strata by some means do not follow the shrinkage and sit on the sand, there may be parting of the immediate roof in course of time which may fall suddenly and force out the gas." Thus, in his opinion, the sand had shrunk leaving the roof, and the roof fell within the goafed area, with the result that gas was forced out of it. The Manager also was of the same opinion, namely, that "the gas had come as on-rush from the sand-stowing area". So was the evidence of the Assistant Manager, namely, "In my opinion, in all probability, the gas had come out from the rise stowed area on the date of the explosion." The criticism against this theory was that, in this goafed area, there are three barricades, only one of which was broken and two remained intact. The suggestion was that, if gas had come out of the goafed area, it would come out from all sides and not from only one side. Further more, if there had been emission of gas from inside the goafed area, sand would have been thrown outwards, which was not found to have been the case. S. C. Ghosh (witness No. 7 for the Court) gave this evidence: "When gas rushes out of a stowed area, the gap between the roof and the sand would become high, and the sand would be thrown out. I did not see any sign of sand having been thrown out in my visit." According to the evidence of the Assistant Manager, he had observed a channel on the top of the sand in the goafed area, about two weeks after the explosion. He gave the width of the channel as being 6 to 8 feet and its length

about 20 to 30 feet. It was from this that he concluded that there was a roof-fall in the goaf. When he had made this observation, somebody of the Mines Department was with him: so he said; but he admitted that he did not point out this to the Mines Department man when he observed this channel. He also said that he was present when the Court of Inquiry had visited the mine, and he again admitted that he did not point out that channel to the Court of Inquiry either, and he explained the omission by saying that this was because he did not go with the Court of Inquiry up to that point. "But there is no reason why he could not have gone up to that point with the Court of Inquiry. The theory of gas having been forced out of the stowed area by a roof-fall having taken place inside it does not find support from one piece of evidence of Ghosh when he said: "I did not see any roof-fall inside the goaf", although the Assistant Manager stated: "There was a roof-fall on the barricade inside the stowed area." According to the Management, by reason of the shrinkage of sand in the goaf area, there had been left a space of about two feet between the sand and the roof. Now, the goaf had been completely stowed sometime in December, 1954, and, according to the Assistant Manager, this amount of shrinkage would take place after about four to five months. The disaster in the mine was only shortly after a month from the time of the stowing. That amount of shrinkage of the sand, therefore, in the goaf area in that period of time would be highly improbable. Whitaker was examined by the Court as an expert in these matters, and he was put the question: "Can you give us some light upon the suggestion that there had been a sudden on-rush of gas from the stowed goaf area?" The witness had gone down the mine for inspection, and he gave the answer: "It is not possible; but it is not to be expected, unless there is a similar record of gas driven from the goaf area into the mine area by a similar force in the past." Another passage from his evidence may be quoted. He was asked: "Assuming that there was a definite gap between the sand stowed and the roof above it, and a portion of the roof fell on the sand, will it not occur that the quantity of gas or air displaced as a result of the fall would go in all the four directions and not in one?" His answer was: "The gas will move in the direction in which there is freedom and will preferably go upwards as it is a light gas." There is no history of such an emission of gas having taken place in this mine. Gas was being emitted from inside the goaf area gradually and daily, and it was being diluted. In case of emission of gas as a result of a roof-fall, the pressure would have gone on all sides, and it is improbable that the gas came out in a channel. As a result of such an emission, I would expect sand to have been thrown out to some distance. The Assistant Manager said that a portion of the roof had fallen on the barricade. The would explain the damage to the barricade and the fallen out of sand, leaving some space between the roof and the sand.

34. One thing which suggested itself to the Court was whether there could have been a roof-fall in the goaf by reason of the sand not having been packed up to the roof. Bose (witness No. 2 for the Department), Assistant Chief Inspector of Mines, gave evidence of some goaf not having been completely packed. But that he had found in May, 1954. He had then inspected a goaf which was far beyond the affected area where the explosion has taken place, to the south-east of it. He stated that he had found that stowing of the south district goaf "was not in order, and timbering work was not systematic". He submitted a report, exhibit M-4. In that report, the witness had found large areas of voids in the rise workings of the main south level, and he said that was due to "a break down in the aerial ropeway and, therefore, stowing lagged behind the extraction", the period being between the 10th and 18th May, 1954. The management were informed by a letter, and they sent a reply that the defects found would be put right. The witness had not, of course, seen the present goaf from which gas, according to the Management, had come as on-rush. We have thus no evidence of this particular goaf having not been properly stowed up to the roof: the evidence, on the contrary is otherwise, as I shall show presently. It is not the case of any party to the inquiry that roof-fall had occurred because the goaf had not been properly packed with sand up to the roof. It would not be right so to hold now—without evidence and contrary to the case presented before the Court.

35. Another line of argument for the Management was that it may well be that, by reason of barometric pressure on the afternoon of the day of the accident, a large volume of gas was forced out of the goaf area, as, "when the pressure is reduced, the volume of gas will be greater in the ratio of the two pressures". But this argument again is unacceptable for want of sufficient data, and, apparently, during the time that the recording of evidence was proceeding, the Management was not keen on such a theory for a sudden emission of gas. I quote the following passages taken from the evidence of the Manager:—

"I do not keep a record of barometric pressure."

"There was no record kept of the barometric pressure from the month of January up to February 5th, 1955.

X

X

X

X

"About a week after the incident an enquiry was made from the School of Mines regarding the barometric pressure at about the time of the accident on the 5th of February, 1955, and we were informed that there was a depression of barometric pressure at that time. X X X

"I do not know whether there was any fall of barometric pressure a day before the day of incident or a day after the day of incident."

And he had already stated: "This slight fall of barometric pressure is insignificant and can also happen normally in the months of June and July." The effects of barometric changes are far from uniform and depend on the conditions of each pit. Thus it is not possible, on the evidence available, to accept the argument that there had, in fact, been a sudden emission of a large volume of gas from the goaf because of a change in the barometric pressure that afternoon.

36. On behalf of the Management, it was pointed out that, in the written statements filed by the parties, the possibility of an on-rush of gas is not denied. In these written statements, some theories have been suggested, and the Court has to examine which, on the evidence available, can be accepted as the correct one. Assuming that there had been such a possibility, the onus on the officers of the Management was still heavier to safeguard against accumulation of gas due to such an on-rush, and I have shown that, on the fateful day, sufficient care was not being taken to ensure proper ventilation which amounts to very serious neglect on the part of the officers of the Management.

37. *Shrinkage of sand.*—The theory put forward by the Management, namely, that of sudden on-rush of gas from the goaf, is based on the supposition that there was shrinkage of sand in the goaf area, and a gap had been left between the roof and the top of the sand, with the result that there was a roof-fall in the goaf. Whether shrinkage can take place in a sand-stowed area is a controversial question; and literature on this subject is lacking. Stowing of a goaf with sand is done in very few places outside India, and sufficient attention has not yet been paid to this branch of the subject. According to the Manager, shrinkage may go up to 15 to 20 per cent of the total height of the seam, while, according to the Agent, shrinkage may amount to 5 to 10 per cent. According to the case of the Department, a gap in a stowed area can arise (a) if the goaf is incompletely stowed, and (b) if the sand in a completely stowed goaf shrinks and leaves the roof forming a void above the sand. The Assistant Manager of the mine has said that the area had been "completely sand stowed", and the Manager used the expression that the goaf had been "properly stowed". Burch (witness No. 1 for the Court) is the Superintendent of Collieries under Messrs Macneill Barry & Co., and, as already stated, Amlabad colliery was one of the collieries under his charge. He said that, from the reports of the Manager, the Agent and the Chief Surveyor, he came to know that sand stowing was done "efficiently", and he explained that "by efficient sand stowing, I mean the void created by the extraction of coal is stowed with cent per cent sand, that is to say, right up to the roof". He also said that, in the course of his inspection, he did not notice any shrinkage in the stowed area of the main south depillaring district, and he added: "I do not think that such a stowed goaf would be a source of accumulation of gas. No roof-fall or subsidence would occur in a stowed goaf of the nature as it is in the main south level depillaring district." And by main south level depillaring district he meant, he said, the depillaring district near the affected area. This witness also made the following statement: "I am not certain if sand shrinks. Sand stowed hydraulically does not shrink in the stowed area. I have seen many stowed areas and have not found sand shrinkage and leaving the roof." Another witness, Wright (witness No. 2 for the Court), who was the Agent of the Amlabad Colliery till the end of 1954 under Macneill Barry & Co., said that there was a possibility of shrinkage of sand in the stowed area. But he added: "the roof will also settle on the sand"; and he explained: "The settling down of the roof on the sand does not take place by virtue of any fall of the roof or fracture of the roof. The roof subsides by itself along with the shrinkage. Such subsidence of the roof does not cause any cracks or fissures on the surface."

Another question which arose was whether shrinkage could take place from pressure. Such shrinkage, of course, must be due to the weight of the roof on the top of the sand, the sand being compressed. But such a shrinkage cannot result in a gap between the roof and the sand, and no question of emission of gas from such an area can arise.

The Agent has stated that the roof starts above the coal seam in the Amlabad mine parts easily. He is speaking here as the roof strata in general. The roof in a goaf area cannot stand without support, so that it is bound to settle along with the shrinkage of sand, if any. According to the Manager, the roof in No. 18 seam, with which we are concerned in this inquiry, is friable shale for about 2 and 2½ feet and above that hard shale exists. Roof of shale is weak, and a roof of friable shale is much weaker, and would not be able to stand, so that it will subside along with the shrinkage of sand.

Having considered the cumulative effect of all these circumstances, I have come to the conclusion that accumulation of gas could have certainly taken place as a result of inadequate ventilation, but for gas to be emitted as an on-rush from inside the stowed goaf area seems to be improbable. On the materials before me, I am led to the conclusion that there took place accumulation of gas along the stowed edges and in the endless rise area by reason of derangement of ventilation on the 5th February, 1955, and I do not think I can accept the case of the Management that there had been an accidental or unexpected on-rush of gas from inside the gap said to have been formed between the roof and the stowed sand.

#### VI.—CAUSE OF THE EXPLOSION

38. Now, gas in explosive mixture being present, an explosion cannot occur unless there be a source of ignition, and this leads me to the consideration of the cause of the accident. I must confess that this question has caused me the greatest anxiety. It has been aptly said: "An explosion is the nearly perfect criminal; it never confesses, seldom spares an eye-witness, and destroys most of the circumstantial evidence it might otherwise leave." (See F.V. Tideswell in Part 3 of Volume 112 of 'Transactions of the Institution of Mining Engineers'). An investigation into this question demands experience and scientific resource. No witness survived to help the inquiry in discovering the cause of the explosion. In the written statements filed by the labour organisations, the Department of Mines and the Management, several causes have been suggested, namely, the following:—

- (1) Underground fire;
- (2) Shot-firing;
- (3) Sparks produced from coal-cutting;
- (4) Naked flame;
- (5) Frictional spark from heated surface;
- (6) Safety lamps; and
- (7) Spark from an electric apparatus.

Gas may be ignited in a mine ordinarily by one or more of the above causes. It seems to me that the only method possible to discover what was likely to have been the cause of ignition in this colliery on the 5th February, 1955, is the process of elimination, and I would proceed accordingly.

39. *Underground fire.*—Rescue teams had commenced work within 2 or 3 hours after the explosion. No circumstance was found in the course of the visits of any of the rescue teams to suggest a case of an underground fire. No witness has spoken about it, and no party asserts it.

40. *Shot-firing.*—On the date of the explosion, shot-firing had been done in the affected area and in that shift. The shot-firer was Shyamapada Bhowmik (witness No. 5 for the Management). He stated that shot-firing and dressing were completed by 12-30 to 1 p.m. The shots were fired at the working place marked W-1 in the plan M-1\*. Bhowmik, however, remained underground up to 2-30 p.m. in order to have necessary directions if further shots were to be fired, and, as no further directions were received by him from the mining sirdar, he came up to the surface between 2-30 and 2-45 p.m., that is, very shortly before the time of the explosion. In the mine on that same day, besides Bhowmik, there was one other shot-firer, Durga Das Chatterji by name; but he was in the main dip section in the south district where he was killed and which was at a considerable distance from the rise section. There is no reason to doubt the evidence of Bhowmik. Consequently shot-firing cannot be connected with the cause of the explosion.

\*Not printed.

41. *Sparks produced from coal-cutting.*—This, again, is nobody's suggestion, and we have no indication of any spark caused from coal-cutting igniting the gas.

42. *Naked flame.*—A half-hearted suggestion was made on behalf of the Management that a match for lighting biris might have been responsible for the ignition. Amongst the dead bodies brought out to the surface after the explosion was the body of one Kheloo Mahto, and it is stated that, in a pocket of his shirt, there were found some biris. The Manager has said in his evidence that, when the dead body of Kheloo Mahto was brought on the surface, the police took charge of the dead body, and they found biris in his pocket, and he also said that the biris were in the custody of the police. The evidence of no police officer was forthcoming to support the finding of biris in his pocket, nor were the biris themselves produced. This finding, I may emphasise, was on the surface, and there is no evidence that any biris or biri-ends were found inside the mine. On the other hand, the definite evidence of Surajballi Missir (witness No. 4 for the Management) is that, after the explosion, he, along with the Deputy Chief Inspector of Mines, had inspected all the places in the rise section as also some other places, and a search was made for biris, cigarettes and matches, but none was found. Furthermore, the dead body of Kheloo Mahto was found some 400 to 500 feet away from the area wherein the explosion took place, and I have just stated that in the rise area, where the explosion occurred, no circumstance was forthcoming to indicate smoking or the presence of naked light. Accordingly, this cause must also be eliminated.

43. *Frictional spark produced from heated surface.*—Although this was given in the list of probable causes in the written statement filed by the Management, it was stated in the same written statement that this cause must be ruled out [see paragraph 22(c) of the written statement filed by the Management]. Yet in evidence the Agent and the Assistant Manager, who were examined on behalf of the Management, did propound theories to suggest that ignition was caused by a frictional spark. The Agent, Sharma, when questioned as to what, in his opinion, was the source of ignition of the gas, replied: "In my opinion, the ignition of gas may have been either by some naked light, for example, smoking, or by some spark produced by fall of roof over the stowed area." He clarified his evidence later on by stating thus: "In my evidence I stated that the sparking due to the hard substance striking over any other hard surface might have taken place in the stowed area. In that area, I mean in the cavity over the sand-stowed area, the percentage of inflammable gas would be about 95 per cent." The Agent later admitted that, when gas is over 14 per cent., it does not explode. The suggestion, therefore, that there was a roof-fall over the stowed area causing frictional spark cannot be accepted for the reason that, the percentage of inflammable gas being about 95 per cent., it could not explode. The Assistant Manager said that the source of ignition, according to him, was "a spark produced by roof fall on the floor, that is to say, big pieces of stone or any big mass has fallen down on the floor and produced frictional heat causing spark which, in all probability, has ignited the explosive mixture, that is to say, the gas." The Assistant Manager seems to give a different picture, namely, that the spark was not produced by a fall of roof over the stowed area as the Agent had stated but that it was produced by a roof-fall on the floor outside the stowed area; and the Assistant Manager has made this clear by saying: "When I spoke about the roof-fall causing ignition, I meant a roof fall at the mouth of the stowed area, that is to say, outside the stowed area." This opinion would apparently be contrary to the opinion expressed by the Agent. The Assistant Manager then made this admission: "I did not give out my opinion regarding the probable cause of ignition to anybody till I made my statement here in Court today," and he emphasised this by saying: "I made no statement before the lawyers before being examined in Court today." Such a cause was not stated in the written statement filed by the Management, and, when this witness was cross-examined about this omission, he said: "I do not know if any written statement has been filed on behalf of the Management." He is the Assistant Manager in the Amlabad Colliery, and I cannot imagine that he was so ignorant about the written statement filed on behalf of the Management. Now, this witness was asked to clarify his statement a little further, and I quote his own words: "According to me, the roof-fall outside the goafed area, of which I have spoken, had been due to the onrush of gas. According to me, the events were—onrush of the gas from the goafed area, then immediately the fall of the roof outside the goafed area, and then the sparking on the floor due to friction, and then the ignition and then the gas explosion. According to my opinion, the gas which had come out of the goafed area had filled up to the floor level, and, when the roof fell and friction caused, the ignition of gas took place at that floor level, and after that there was explosion." He further said that, when the gas came on an onrush, it filled up the space quickly, top and bottom, that is, the

entire atmosphere. But, as the Agent has stated, the percentage of gas was 95 per cent., and it could not explode. No ignition could thus take place. Whitaker (witness No. 6 for the Court) was asked by the Court to give his expert opinion in this matter. I would like to quote *verbatim* the questions and the answers:—

Q. "There is a theory put forward by Mr. Sharma, the Agent of Messrs. Karam Chand Thapar & Bros. for the Amlabad colliery, that, as a result of roof fall in the goaf area, there was a spark therein as the roof fell on pebbles in that goaf area, and further the spark caused the ignition and there was, consequently, an explosion. What would be your comment on this?"

A. "In the first place, frictional sparks are generally safe, but not always. In extreme cases, they are not so. Secondly, the amount of gas present would have to be between 5 and 15 per cent. to give an explosive mixture. In the goaf, if there was more gas or less gas than this, there would be no explosion. So the theory is highly improbable."

Then, he was questioned regarding the theory put forward by the Assistant Manager, and here again I quote the question and the answer *verbatim*:—

Q. "There is yet another theory on which I would like to have your opinion. That theory is that placed before this Court by one of the witnesses for the Management, namely, the Assistant Manager, Mr. Chatterji. His theory is that there was a roof fall in the goaf area, resulting in a sudden emission of large quantity of gas from the goaf area. This emission of gas caused a roof fall in the immediate vicinity of this goaf area, and this roof, as it fell on the floor, caused a spark which caused ignition and resulted in the explosion?"

A. "This again, in my opinion, is an improbable theory."

In fact, as I have pointed out, in paragraph 22(c) of the written statement filed by the Management, this theory would seem to have been ruled out by the Management themselves, for it says: "there was no fall of sand stones, etc., was visible." The written statement was filed on the 20th March, 1955. And, in paragraph 20, it is stated that expert opinion had been taken.

The Manager was questioned about the roof above No. 18 seam, and he said: "About 2 to 2½ feet form friable shale and over which hard shale exists." And Whitaker, the expert witness said: "As a rule, dangerous tupe of quartz or silica is found in specially hard sand stones, and not in shales." And further he said: "It is most unlikely that silica in disseminated form, as it exists in shale, will cause a dangerous frictional spark." The condition most likely to cause ignition would appear to be when a large mass of rock falls some distance and glides along the sharp edge of another piece; or when a mass of falling roof causes the grinding of two surfaces against one another under great pressure ["The ignition of firedamp by the heat of impact of rocks": By M. J. Burgess and R. V. Wheeler, page 22]. The greatest mining hazard is due to quartz. It has been suggested by some authors that quartz is the only mineral responsible for an ignition hazard. According to the Assistant Manager, what fell from the roof was 3 feet of coal. That could not cause ignition. For all these reasons, I find myself unable to accept either the theory propounded by the Agent or that propounded by the Assistant Manager on behalf of the Management, namely, the theory that there was emission of gas from the goaf area by reason of a roof-fall over it which caused ignition of the gas so emitted, or the theory that there was emission of gas from the goaf area causing a roof-fall in the vicinity of the goaf area, and this roof-fall caused ignition of gas emitted from the goaf. I would reject these theories in toto. There is no suggestion of any other frictional spark causing ignition.

44. *Safety lamps*.—Gas could have been ignited either (a) from the flame of a defective safety lamp or (b) by tampering with a safety lamp. I take up the first part, namely, (a) whether there could have been ignition from a defective safety lamp, which means whether any defective safety lamp had been supplied to any miner. There were 49 safety lamps recovered from the mine after the explosion: 47 safety lamps were recovered by S. N. Ramanathan (witness No. 18 for the Court), Assistant Chief Inspector of Mines, on two dates—the 24th and the 29th March, 1955—and two lamps were recovered by B. N. Mukherji (witness No. 19 for the Court), Junior Inspector of Mines, on the 30th March, 1955; and one safety lamp was later produced by the Management. That makes a total of 50 lamps. Each of these safety lamps was examined by the Court of Inquiry, and no defect was found in any one of them. 52 men died underground. 52 lamps

must be taken to have been issued to them. The Court of Inquiry examined 50 lamps. Hence, two lamps stand unaccounted for.

These 50 lamps, as appears from the Lamp Register, were issued to the men who were working in the affected area or in its neighbourhood. The position of the dead bodies has been indicated on a map which is being submitted along with this report (Appendix IV). Accordingly, it is certain that these 50 men working in the affected area or in its neighbourhood had no defective safety lamp. This position has been accepted by all the parties. Now, the question remains whether the two unaccounted safety lamps, or any one of them, had been defective. From the state in which the Lamp Register has been kept by the Management, it is not possible to find which are those two lamps and to whom they had been issued. The state of the Lamp Register is this:

There are at least 4 lamps which had been issued to four of those killed inside the mine, yet their lamps are shown as returned to the Lamp Room, but not shown by whom returned; these are (1) lamp No. 692 issued to Jugal Mahton, (2) No. 339 issued to Raj Bahadur Prasad (his dead body was found in the sump, long way off from the affected area; his lamp also should have been found there but his lamp was shown as returned to the lamp room and, instead, a lamp, No. 1012, issued to S. B. Misra was found there. (S. B. Misra had reached the pit-bottom before the explosion), (3) No. 7 issued to Jhagru Rajwar whose dead body was found near the 60 H.P. haulage main dip, and (4) No. 163 issued to Budhu Chamar whose dead body was found near the main dip haulage road. Another lamp, No. 861, issued to Bande Ali Mian has been shown as returned to the Lamp Room, though Bande Ali Mian was brought out from underground in an unconscious state and without his lamp. It has not been explained how this lamp found its way in the Lamp Room. It was pointed out that at least 3 lamps found in the south district have not been shown as issued to any of the victims. Again, in case of some lamps, the number on the bonnet does not tally with the number on the oil can, e.g. in one case, the number on the bonnet is 991 while that on the oil can is 360 and, in another, the number on the bonnet is 267 while that on the oil can is 522. Further, on the 5th February, 1955, three lamps, Nos. 531, 729 and 191, are shown as issued to one man, Kesho Rajwar. No attempt was made on behalf of the Management either to contradict these statements or to offer explanations for these apparent discrepancies. In this state of the circumstances, no conclusion can be drawn from the absence of some lamps. I may add that it is the case of no one that the cause of the explosion could have been a defective safety lamp, and, in the circumstances disclosed, I do not think that I can even suspect such a cause.

45. Now, I come to the second part, namely, (b) whether any safety lamp had been tampered with inside the mine. There is no allegation in the written statement filed on behalf of the Management regarding the tampering of any safety lamp inside the mine. This written statement was filed on the 20th March, 1955, and it is stated that the statements were made therein after consulting an expert, though the name of the expert is not disclosed. I emphasise this because one of the witnesses examined by the Court, namely, S. C. Ghosh, made a statement in his evidence that he had been informed by certain men, who too have been examined by the Court, that a safety lamp in a damaged condition was found in the rise area. Ghosh's examination commenced on the 18th June, 1955. Before that date, there appears to have been no suggestion from any one and at any time that any damaged safety lamp was found in the affected area. The Agent, Sharma, said that he had generally discussed about the explosion with the Manager, and that, when the written statement on behalf of the Management was being prepared, he and the Manager had sat down for an hour or two for a joint discussion. He had even discussed this question with the Chief Mining Engineer of Messrs. Karam Chand Thapar & Bros. as also with one Mr. H. K. Banerji, one of their Agents. The Agent's examination had commenced on the 31st March, 1955. The Assistant Manager, Chatterjee, was examined on the 18th of May, 1955, and he too spoke not a word about the finding of a safety lamp in a damaged condition. This evidence regarding the finding of a damaged safety lamp came for the first time from the mouth of S. C. Ghosh on the 13th June, 1955. It, therefore, becomes necessary to examine the evidence of Ghosh.

46. Ghosh is, at present, the Superintendent of the Tata collieries, and has nothing to do with the Amlabad mine. He had gone down the Amlabad mine only a day after the explosion, and he explained that this was because some members of Parliament had come to visit the Washing Plant in Jamadoba colliery, and, having heard about the explosion in the Amlabad mine, they expressed a desire to see this mine, and so he went along with them taking the Chief Mining Engineer of the State Railway collieries, Mr. A. B. Guha, as also the Deputy



Chief Inspector of Mines, Mr. Jabbi. The next time he visited the mine was on the 10th April, 1955, and, for this visit, his explanation was as follows:—

"I had gone down the mine on the 10th April, 1955, at the instance of Messrs. Karam Chand Thapar & Bros. who had approached our Agent's office at Calcutta to allow me to go down the mine to find out what method they should adopt to work it. It may also be because they wished to examine me as an expert witness.

"The Chief Mining Engineer, Mr. Banerji, some other high officers of Messrs. Karam Chand Thapar as also Mr. Sharma, the Agent, accompanied me down the mine."

On the first day, when the inquiry had started before the Court, Ghosh had come to the Court to ask for permission to visit the colliery. He said: "I had come here to enquire if the Court would permit me to visit the colliery as I had also been requested to do so by Messrs. Karam Chand Thapar." This was on the 31st March, 1955. Clearly, he had been contacted by Messrs. Karam Chand Thapar before that day. One Mr. Dharambir, an employee of Messrs. Karam Chand Thapar, was meeting Ghosh, for the said: "Mr. Dharambir, some officer employed by Messrs. Karam Chand Thapar, showed me a ferro plan indicating the situation existing after the explosion in the area which had been affected in the Amlabad colliery. This I had seen on the 10th of April." Ghosh admitted that what Dharambir had shown him was really a copy of the plan marked exhibit M-1\*. Ghosh said that Dharambir had come to him with the ferro plan two or three times to his house, and he had discussed the matter with him, and that Dharambir had seen him for the last time only four or five days before he gave his evidence when he had again discussed the matter with him for about 5 to 10 minutes. Dharambir stays at the Amlabad colliery. Before meeting Dharambir on this occasion, Ghosh admitted that he had come to know that he was to be examined as an expert and as a Court witness in this case; but he did not think it improper to discuss the matter with Dharambir only a few days before giving evidence. The reason why I have stated these facts is that Ghosh's evidence regarding the finding of a damaged safety lamp in the rise area is open to serious criticism on this ground that, according to his own evidence, he had come to know about this about the end of February, 1955, and he had it confirmed in March and April, 1955, but yet he does not seem to have disclosed this fact to any one of the employees of the Management, although he was being contacted by the Management so often. The finding of a damaged safety lamp was perhaps the most important circumstance regarding how ignition might have been caused; but Ghosh did not disclose it to any of the officers employed by the Management. He had been approached by Dharambir only a few days before he gave his evidence. These circumstances laid his evidence open to serious criticisms. This silence on the part of Ghosh is inexplicable. All through this inquiry till Ghosh gave his evidence, the theory put forward on behalf of the Management regarding ignition was, as I have discussed above, roof-fall either within or outside the stowed area. Ghosh's evidence regarding the finding of a damaged safety lamp, admittedly, is hearsay, and I shall presently come to the evidence of the witnesses by whom, Ghosh said, he had been informed. On having been informed that a damaged safety lamp had been seen in the affected area, Ghosh's surmise about the ignition was in these words, which I will quote from his evidence: "I surmise that the flame of the safety lamp was extinguished, and then it was opened and thereafter an attempt was made to relight it, probably with a match stick, and then the explosion took place." If the flame of this particular damaged safety lamp had been extinguished, it was scarcely necessary to open it (it had been rivetted with lead) and the attempt to relight it with a match stick. According to Ghosh himself, there were other safety lamps burning. Therefore, it was scarcely necessary to open the extinguished safety lamp to relight it. There was no indication or suggestion all through the inquiry that a match stick had been struck within the mine: no such evidence, either direct or circumstantial, has been forthcoming. I have already referred to the evidence of Surajballi Missir which is to the effect that a search was made for biris, cigarettes and matches, but none was found. Surajballi Missir also, said that they did not come across any safety lamp lying open, or tampered with, in the rise section. Ghosh has himself admitted that his "surmise was upon hearsay evidence, namely, that he had been told by others that a damaged safety lamp had been found". I have criticised the evidence of Ghosh that, if he was, in fact, so informed as early as the end of February, 1955, as he says, and had it confirmed in March or April, 1955, his failure to give the information to any of the officers of the Amlabad colliery is a matter which has not been explained. The Management were kept in the dark, not that Ghosh was unknown to them, for indeed it was at the instance of the Management that Ghosh had inspected

\*Not printed.

the colliery on the 10th April 1955. Apart from this conduct of Ghosh, it will be necessary to examine the evidence of those witnesses who, according to Ghosh himself, had given him the information about a damaged safety lamp having been seen by them in the rise area.

47. These witnesses are C. R. Bose (witness No. 8 for the Court), N. P. Singh (witness No. 10 for the Court), G. J. Banerji (witness No. 11 for the Court) and S. B. Tewari (witness No. 12 for the Court). And the evidence of S. B. Ashtikar (witness No. 13 for the Court) will also be relevant in this connection. Of these witnesses, C. R. Bose, G. J. Banerji and S. B. Tewari are working as subordinates of Ghosh. Ghosh being the Superintendent of the Collieries of Tata Iron & Steel Co., Dighwadih and Jamadoba collieries are within his jurisdiction. C. R. Bose is the surveyor in the Dighwadih colliery; G. J. Banerji is an Assistant Manager in Jamadoba colliery; and S. B. Tewari is a mining sirdar in Dighwadih colliery.

C. R. Bose is the captain of the rescue team attached to Dighwadih colliery, and he had taken part in the rescue work in the Amlabad mine after the explosion. He said that, when he had gone down the Amlabad mine on the evening of the 6th February, 1955, he had come across an open safety lamp in the rise area. He had found only the top portion of the safety lamp while the oil pot was not there. Ashtikar was the captain of his team, of which the witness was a member. This evidence of C. R. Bose was challenged. He admitted that, at the time, he did not draw the attention of his captain, or of any member of his team, to that fact, but he said that he informed the captain of his team when he came to the fresh air base underground. After that, he spoke to two men only, namely, to S. B. Tewari, one of the members of his team, and to Ghosh, the Superintendent of Tata collieries. C. R. Bose said that he found the glass of this safety lamp absolutely broken; and, as I have stated, he did not see the oil pot. He, therefore, saw, if at all, only a portion of this safety lamp lying on the ground. Neither did he stop when he saw this portion of the damaged safety lamp lying, nor did he, at the time, draw the attention of any member of his team. He did not even think of looking for the oil pot. Ghosh suggested that, in his opinion, this safety lamp having been extinguished, it was opened in order to relight it. C. R. Bose said that, if an individual wants to open it, he can only do so by means of a sharp instrument, such as a thin-pointed iron rod, as the lamp is rivetted with lead. According to Bose, it could also be opened by a pick. No instrument like a thin-pointed rod was found at this place. On the surface, such lamps are opened and rivetted by a machine. It was suggested to him that it would take hours to open such a rivetted safety lamp, and he gave the reply: "I cannot contradict you if you are to suggest that it will take hours for an individual to open a rivetted safety lamp." One important reason why I hesitate to accept the evidence of C. R. Bose is that, according to his evidence, he had informed Ashtikar, the captain of his team. He said that, when he told Ashtikar about it, Ashtikar said nothing to him. He did not make even a remark about it. This seems to me somewhat incredible, as it must have been realised that the finding of such a piece of evidence was very important from every point of view. Ashtikar was examined as witness No. 13 for the Court. He said that, on the evening of the 6th February, 1955, he had gone down the Amlabad mine as the captain of the fourth team, of which S. B. Tewari and C. R. Bose were two of the members. He admitted that he himself did not see any damaged safety lamp lying anywhere, and he explicitly contradicted C. R. Bose by saying that, although C. R. Bose was a member of that team, he never spoke to him about his having seen any damaged safety lamp lying anywhere in the mine. Ashtikar was told about the statement of Bose to the effect that he had given such an information to him, and then Ashtikar said about that statement as being "incorrect" Ashtikar had noticed about half a dozen safety lamps lying about during his visit; but, strangely enough, Bose did not see any one of these safety lamps but saw a damaged safety lamp which was not seen by Ashtikar. When a rescue party returns to the surface, usually the captain makes an entry on a card in connection with the rescue work, and, with regard to the work of this particular team, Ashtikar had made the entry in a card which is exhibit C-35. There is no mention in that card of a damaged safety lamp having been seen by the rescue party. Indeed, Bose said that he did not even enquire from Ashtikar at any time if he had mentioned in his report regarding what he (Bose) had told him about seeing a part of a safety lamp lying in a broken condition. A matter of this kind may well be expected to have been recorded in the report. Ashtikar was questioned about his report on exhibit C-35. The question put to him was: "If you had been informed by any one about the finding of a damaged safety lamp in the mine, would you have mentioned this fact in the report?", and he gave the answer: "I would have immediately brought it to the notice of the authorities, and I would have also mentioned about this in my report." Now, Bose said that he did not

remember how far away the other safety lamps were from the portion of this damaged safety lamp which he had noticed. It is in evidence, however, that two safety lamps bearing Nos. 26 and 33 were lying almost at that very place, and three or four others at a short distance. If Bose had seen the damaged safety lamp lying on the ground, it should have been expected that he should have been able to see and remember the other safety lamps which were intact. Ghosh deposed that he was given this information by Bose sometime of the end of March or the beginning of April, 1955; but Bose said that he had informed Ghosh "about 15 or 20 days ago from today". This statement he made on the 14th June, 1955. Bose, accordingly, had informed Ghosh in the third week of May, 1955. The evidence of the last witness for the Management was closed on the 20th May, 1955. It seems a strange coincidence that, after the Management had closed its evidence and had given its version of the ignition, Bose supplies a fresh information to Ghosh regarding the finding of a damaged safety lamp by him as far back as on the 6th February, 1955, and that too not of his own accord but on being questioned by Ghosh, since the witness said: "Mr. Ghosh had himself asked me one day what I had seen in the Amlabad colliery, and it was then that I spoke to him about my having seen that lamp." I may repeat that Bose is an officer subordinate to Ghosh. Such a new piece of information thus supplied after the close of the case of the Management and in circumstances mentioned above does not appeal to me as being acceptable.

S. B. Tewari (witness No. 12 for the Court) was a member of the same team of which C. R. Bose was and of which Ashtikar was the captain. Tewari deposed that he had seen a damaged safety lamp in the rise area. He did not see or find the oil pot. Tewari admitted that, although Ashtikar was the captain of his team, he did not tell him about his having seen such a damaged safety lamp; and he added: "I have not spoken to him even up till today about it." He also said: "I have made no note in writing anywhere about my having seen that damaged safety lamp," and he said that he informed S. C. Ghosh about it a month and a half later, when Ghosh had gone down the mine (that is, Dighwadih mine) where he (Tewari) was working, and it was when Ghosh had questioned him about the work he had done in the rescue operations at the Amlabad colliery, that is, about a month or a month and a half earlier, that, Tewari said, he informed Ghosh. The witness said: "I could not understand why Mr. Ghosh was asking about these matters after a lapse of one and a half months." Sharma, the present Agent, was present at the fresh air base, as is admitted by Tewari, when Tewari spoke to Bose about this damaged safety lamp. Tewari said that Sharma was then about 20 steps away from the place where he and Bose had talked about this safety lamp. But Tewari never spoke to Sharma. Sharma was the man who was most concerned as having been the Agent of the mine; but he was not given this information. Tewari gave the following explanation for this omission: "I did not tell Mr. Sharma about this, as the rule is that whatever we see we must keep strictly secret amongst ourselves." And then, in the very next sentence, he said: "I cannot give any reason why I did not discuss this matter with Mr. Sharma." Tewari admitted that there was also a Mining Inspector present; but he did not mention that fact to him either, although he said: "I had nothing to conceal from the Mining Inspector." For his omission to speak to Ashtikar, Tewari said: "I did not speak about this safety lamp to Mr. Ashtikar, as I imagined that, being the captain of the team, he must have seen the safety lamp and made a record of the fact." Tewari could give no reason for not having drawn the attention of any member of the team while passing by that damaged safety lamp. In cross-examination, Tewari was asked about the implications of such a find, and he said: "I do not understand what would be the implication in this case if it is proved that actually a damaged safety lamp had been found inside the Amlabad colliery after the explosion." He is a mining Sirdar in Dighwadih colliery, and I cannot believe that he could not understand the implications. Tewari spoke about his having seen 10 or 12 safety lamps at a distance of 5 to 7 feet from the damaged safety lamp; but we get indications of two such safety lamps only. Again, Tewari saw no safety lamp near about the dead bodies; but here again we get indications of two safety lamps at this place as well. I find Tewari's evidence most unimpressive, and as I have said, he is working as a subordinate to Ghosh.

G. J. Banerji (witness No. 11 for the Court) is an Assistant Manager of Jamadoba colliery, and, as such, he is another officer subordinate to Ghosh. He deposed to have seen the top portion of a safety lamp as also an oil pot. This was on the night of the 5th February, 1955. The other two witnesses do not appear to have seen the oil pot at all. He had also seen them when he had gone down again as a member of the rescue team on the 6th February. He made no note of such a find in any register, document or paper, according to his own admission, though he had written his report regarding the rescue operations in a book. He made this admission, namely, "I did not mention the fact of my having

seen the damaged safety lamp in my report." And, for this, he gave this explanation: "Because I was instructed to go to an area which was not the area where the damaged safety lamp was lying but this latter area fell on my way to the area to which I was deputed to go." This explanation is utterly unconvincing. He also admitted: "I did not mention the fact of my having seen a damaged safety lamp even orally to anybody at that time." He spoke about it to Ghosh about the 4th of April, 1955. That was the first time when he had given out this information. The witness said that Ghosh had himself made an enquiry from him as to how the explosion had taken place, and then he told him about the damaged safety lamp. The witness admitted: "In my opinion, the finding of a damaged safety lamp was an important finding." Yet he kept this matter as if it was a secret for himself. Indeed, he admitted: "As nobody was enquiring about this fact from me, I did not mention this fact to anybody. I was thinking that this was also an official secret, and therefore I was not speaking. I considered this to be an official secret of the rescue team, and therefore I did not mention this to anybody." The witness explained that, although such was his opinion, yet he spoke about it to Ghosh, because he "thought that it would help him in conducting the mining operations more safely in the mines under him." The witness had gone down the Amlabad mine in a rescue team, and, if he had come across a damaged safety lamp lying in the circumstances in which he has deposed, surely it ought to have struck him that this matter ought to be disclosed so that the Management may be helped in conducting the mining operations more safely in this mine as well. He wrote the log book entry (exhibit C-39\*). Therein he had made a mention of the various other matters unconnected with rescue operations, yet he made no mention about the find of a damaged safety lamp, although he said that, as soon as he had seen it, it had occurred to him that "it was very important piece of evidence for finding out the cause of explosion." His suspicion, on seeing the damaged safety lamp, worked on the very same line as Ghosh's, for he said: "I suspected that somebody, after having opened the safety lamp and having lighted his cigarette or biri, had gone away from that place." When further questioned, the witness said: "I have no documentary evidence to support my evidence about the broken safety lamp which I have given in this Court, and the only person who can testify to the fact that I stated about this is Mr. Ghosh, the Superintendent of my colliery." Earlier, he had stated: "As soon as I had seen the portion of the safety lamp it had occurred to me that it was very important piece of evidence for finding out the cause of explosion." And yet he did not consider it important enough to disclose it to the officers of the Amlabad colliery, for he said: "On return to the fresh air base, I made no report to Mr. Jabbi or Mr. Ramanathan regarding my having seen the damaged safety lamp." With regard to the rescue operation work, the witness said that anything that a rescue team does can only be disclosed to the Superintendent of the Rescue Station and to no one else, and that the Superintendent, therefore, can be informed of all that a rescue team sees or does. But then he stated: "I did not inform the Superintendent of the Rescue Station about my having seen the damaged safety lamp, because the place where the damaged safety lamp was found was not within my jurisdiction, in the sense that I was asked to go to another area, although I was to pass the area where the damaged safety lamp was found." I am constrained to say that the evidence of this witness also leaves me cold.

The only other witness who need be considered on this topic is N. P. Singh (witness No. 10 for the Court). He is an Assistant Manager of Bhowra colliery. He is a subordinate of Sharma, the Agent, as he is working under him. As the captain of a rescue team, he had gone down the Amlabad mine on the evening of the 5th February, 1955, and then he spoke to have seen one damaged safety lamp lying on the ground at that time. He said that it had no glass, and the oil pot was missing. He admitted that this statement of his is not supported by any entry in any paper, document or register. When he was examined by the Court, he had made the statement: "I have never spoken about my having seen that damaged lamp at that place to anybody before this morning." After his evidence in chief, the Court rose for lunch recess. When, after the recess, the Court resumed recording the evidence of this witness, the witness said: "On the very day that I had come out of the rise area, I had told this fact of my having seen the top portion of a safety lamp to Mr. Ashtikar. I said this to Mr. Ashtikar when I returned to the surface." The witness said that he had made the previous statement before the recess because he had not followed the question. It has been noted in the record that the statement had been read over to the witness after having been recorded, and the witness was warned to understand it, and then he said that it was correct. The witness as the captain of the team had made entries in the log book regarding the rescue operations,

\*Not printed.

and, in that report, he made no mention of the fact of his having seen any damaged safety lamp. That report is exhibit C-38\*. That report contains an entry about the finding of an electric drill and about a roof-fall, and the witness was questioned as to why he did not also mention about his having seen the damaged safety lamp, and the witness gave the reply: "Because Mr. Ashtikar said that it might have been due to a mistake of sight, and I accepted this." At the fresh air base at that time, Mr. Jabbi, the Deputy Chief Inspector of Mines, Mr. Ramanathan, the Assistant Chief Inspector of Mines, and Mr. Dutt, the Manager of the Amlabad colliery, according to the evidence of the witness himself, were present but it appears that he gave them no information about his having seen a damaged safety lamp. Ashtikar has categorically denied that N. P. Singh had spoken to him about his having seen any damaged safety lamp. I am not able to accept the evidence of G. J. Banerji either.

48. Ghosh himself had taken no part in the rescue operations, and, therefore, he could not speak about the finding of a damaged safety lamp. All that his evidence shows is that he was informed by those witnesses whose evidence I have already dealt with. I have not been able to accept the evidence of these witnesses. The question then is—Is it possible to act upon the evidence of Ghosh? This too I do not think I can do. Ghosh said that he was informed by one Rashid Khan at the end of February, 1955, by C. R. Bose in March or April, 1955 (but this is contradicted by Bose who said he gave him the information in the third week of May, 1955), by G. J. Banerji on the 4th April, 1955, and by S. B. Tewari about a month or a month and a half after the explosion, that is, about the third week of March, 1955. Ghosh had been in constant contact with Dharambir, a man of Messrs. Karam Chand Thapar & Bros. According to Ghosh's evidence, he had communicated this information to Dharambir sometime about the 6th or the 7th June, 1955, that is to say, only six days before Ghosh came to give evidence in this Court, and it was then that he spoke to Dharambir about his views regarding the source of ignition. I have given the date of the close of the evidence of the last witness for the Management as the 20th May, 1955. These dates are most telling. Ghosh has clearly identified himself with the Management since the time of the explosion, and, in spite of this, he did not communicate about this important piece of find to any officer of the Management. I cannot believe that he would have kept it such a secret till the first week of June, 1955. His evidence cannot be said to be independent or disinterested. The Department of Mines were also kept in ignorance of this matter. If they had been so informed, there was no reason for them to suppress this fact. I am forced to the conclusion that I cannot act upon Ghosh's evidence either. Thus, ignition from a damaged safety lamp as having been the cause of the explosion must also be ruled out.

49. *Spark from an electric apparatus.*—The only electric apparatus which need be considered in this connection is the 60 H.P. haulage engine in the main dip. I shall examine this question from two points of view: first, whether this engine was liable to give out open sparking within the meaning of section 2(1)(x) of the Indian Electricity Rules, 1937; and, secondly, whether, if that be so, the cause of ignition was a spark therefrom. The first question will not arise if the answer to the second question be in the negative. But I think it is necessary to express an opinion on the first question as well, as then another important matter which will require investigation will be whether the haulage engine was rightly allowed to remain at the place where it was.

The engine is not installed in the main intake airway but in a gallery, about 25 to 30 feet deep from the intake airway. A small portion of the intake air will enter into this gallery, and the rest will pass into the third split, then entering the rise area. The stowed goaf was only about 80 feet away from this engine. We have it in evidence that gas was being emitted from this area all the time. This gas had, therefore, to be cleared by adequate ventilation; otherwise there would be accumulation of gas, and, if this haulage engine was liable to give out open sparking within the meaning of section 2(1)(x) of the Indian Electricity Rules, 1937, there was danger of explosion. I have already come to the finding that, owing to derangement of ventilation on the day of the accident, there was accumulation of gas in the rise area.

50. It will appear from the evidence of the Agent of the Amlabad mine that this haulage engine, though he calls it as being situated in the intake, is, in fact, about 25 to 30 feet from the intake inside a small gallery in the rise side, and it is the intake air which is taken into that side. Undoubtedly, if the ventilation

be deranged, there is bound to be paucity of air at the place where the engine was. The Assistant Manager gave his opinion about the source of ignition after "the electrical gear in the main south level (that is to say, this particular haulage engine) had been examined and found to have given no sparks", presumably meaning thereby that, before the time of the examination of this electrical gear, he was not quite certain if it would have given any spark. The Electrical Engineer in the Amlabad colliery is A. B. Guha who was examined as witness No. 8 for the Management. He gave the opinion that this engine could not have given out any spark, and stated: "In that 60 H.P. haulage engine there are 2 places where open sparking can take place, namely, inside the controller and at the motor slip ring. The motor slip ring is totally enclosed and tightened by spigoted joint, and the controller is enclosed by a wide flanged type cover. Therefore, I say that there was no chance of an open spark. There would be open spark if there was no cover to slip ring and the controller, and it was in that connection that I used the expression in my examination-in-chief that there was no chance of an open spark." When he was questioned as to what would happen if there was a short-circuit inside the controller, he said: "In that case, the inside of the controller may get hot due to short circuit conditions and that may generate excessive heat to the cover, and then that may cause ignition to the inflammable gas. My answer is the same regarding the slip ring also."

51. With regard to the covers of the controller and the slip ring, the witness admitted that they were not flame-proof; he said: "These covers about which I have just spoken are not flame-proof, but they can be flame-proof in an equipment which is entirely flame-proof." This equipment is admittedly not flame-proof. And the Electrical Engineer has deposed that, "If inflammable gas is shown on the flame of a safety lamp, the electric current will be cut off, and it is kept cut off until the percentage of inflammable gas is  $1\frac{1}{4}$  per cent. or more." The witness explained: "These precautions are necessary to prevent danger from ignition of inflammable gas. If it is not so constructed as to prevent open sparking, I admit that the danger is greater, or in other words, if it is not flame-proof, I admit that the danger is greater."

52. The witness who was examined by the Court as expert in electrical matters was K. J. Welsh (witness No. 5 for the Court), Supervising Engineer for Andrew Yule & Co.'s collieries. He had inspected this haulage engine before he was examined. He gave his opinion in respect of it in these words:—

"Regarding the question of open sparking, speaking from experience, I have found that this type of resistance can develop exceedingly hot spots which can arc, if the resistance is not in first class condition.

"With regard to the motor, the slip rings could spark while the motor was running, and these were not enclosed in a flame-proof enclosure."

With regard to the carbon brushes, he spoke thus: "I found that two of the carbon brushes on the slip rings had been touching which would cause a shorting between two of the rotor phases. The motor had been running in this condition, because the carbon brush which was in the bent brush-holder was bedded into the slip ring, and there was a slight sign of heating at the point where the two brushes touched." And then he went on to say:—

"The carbon brushes should not have been in the position in which they were found, if the motor had been properly maintained.

"The brush-holder which was lying in a bent position should have been brought back to its original position in order to run the motor correctly.

"From what I had seen of that particular part of the motor I could say that the motor had been running in that condition for at least a few days, depending on the amount of work.

"There would be a tendency for one section of the resistance to heat more than normally due to this defective position of the carbon brushes."

Later in his evidence he said: "I have seen in my experience similar types of resistance develop small hot points, at points where the connections were not hundred per cent. efficient." The witness explained that spark is an intermittent arc, whereas an arc is a continuous flow of electricity between two points, and, as such, he said: "An arc is a more potent source of ignition than a spark." When further questioned on this topic, the witness said: "When inflammable gas enters inside the cover of the controller, explosion of that gas will inevitably take place at the time of sparking, provided the mixture is explosive. If the cover is not flame-proof, it is possible that the flame will travel outside and ignite

the inflammable gas present outside." But he also said: "The explosion which occurred inside the controller, in my opinion, would probably not travel outside unless the strength of the cover was such as to allow distortion at the time of the explosion and permit the flame to travel outside. In my opinion, the cover was probably strong enough to withstand a gas explosion inside. This particular cover in question was of the flange type." On this evidence, in my opinion, the cover of the controller must be excluded from our consideration on the point of ignition, as it would appear to have been strong enough to withstand a gas explosion inside.

53. The witness said that he did not measure the width of the gap for the reason that the controller had already been opened out since after the explosion, and, therefore, any figures which he might obtain at the time of his inspection might not have been those in existence at the time of the explosion. But he gave his opinion that, if the air gap in the joints was more than that specified, namely, 0.02 inch, then the apparatus would cease to be flame-proof and, in that event, flame would travel outside. He stated: "For proper maintenance of a flame-proof apparatus, regular inspection entails the removal of covers, and it is upon the correct replacement of these that the flame-proof properties of the apparatus mainly depend. It is also necessary to wipe the flanges clean of all dirt before the replacement has been made. If the above conditions were not adhered to, the apparatus would cease to be flame-proof if the gap exceeded the statutory limit of 0.02 inch." Accordingly, the gap must not exceed 0.02 inch. No one measured that gap before the explosion, not even the Electrical Engineer of the mine, and after the explosion the cover was removed by the Electrical Inspector of Mines, P. C. Sarkar (witness No. 3 for the Court); but he too did not measure the gap. Hence, the possibility of flame travelling outside the cover through the gap cannot be excluded, though, on the materials, no definite opinion can be arrived at on this matter. Welsh is clear in his evidence that proper maintenance of the apparatus of essential; but no attention appears to have been paid either by the Electrical Engineer of the mine or by the Electrical Inspector of Mines to examine the cover.

54. With regard to the resistance, Welsh stated: "I have used similar resistances in other mines. I would not use it in a mine where gas is likely to occur—not even in the intake airway. I would not use it in a mine where gas is liable to occur, because I have found in my experience that this type of grid resistance is liable to small arcs in the resistance at spots where the conductivity of the metal is not perfect namely, at joints etc." And Welsh explained that at the moment of switching off the engine, the grid resistance is brought into operation for a period depending upon the time which the engineman takes to move from the full-speed position to the off position, and "that is one of the occasions when sparking can take place in the grid".

55. With regard to the slip rings, Welsh said: "There was definitely a possibility of sparking, particularly on the motor slip rings and the resistance. The controller will naturally arc when the circuit is broken under all normal conditions." Even the Electrical Engineer of the mine, A. B. Guha, said that "an uncased slip ring should not be used in a gassy part of the mine", and that, "if the slip ring is uncased, the sparking can be seen directly with open eyes".

56. P. C. Sarkar (witness No. 3 for the Court), Electrical Inspector of Mines, admitted that "In the type of resistance which existed in the 60 H.P. haulage engine, there was the possibility of 'open sparking' within the meaning of the Electricity Rules." He, however, overruled the idea that, in fact, sparking took place, and he explained: "My decision that there could be no open sparking in this particular resistance unit was based on a factor (by which I convinced myself) that there was no energy being used in this resistance unit." This witness also admitted: "Gas could enter into any apparatus in dangerous quantity and cause explosion inside, if it was not a flame-proof unit. In such non-flame-proof apparatus, the flame caused by ignition of gas inside could come out to ignite gas, if there be any, outside the enclosure surrounding the apparatus."

57. Ghosh (witness No. 7 for the Court) also gave his opinion in this respect as follows: "The resistance was of the grid type and not encased but open type. It is liable to spark, if any of the grids was broken and found close to each other or if the gap is very small." Grids in the present apparatus were found near each other, and the gap was very small. This witness said that he examined the slip rings also, and admitted that the slip rings could spark, and he further said: "The slip rings were encased but it is not flame-proof. Therefore, the sparks which could come out of the slip rings would amount to open sparking". P. C. Sarkar, the Electrical Inspector of Mines, does not appear to have paid any

attention regarding whether the electrical apparatus was properly maintained before the explosion, and, as I have pointed out before, this was an important matter to look into. He admitted: "I was not concerned as to how the various parts of the electrical unit were being maintained prior to the explosion," and the reason he gave was, "as most of them were lying in a devastated condition". Then again: "With regard to maintenance, it did not even occur to me to examine any records or to examine any persons. I made the examinations of the various parts while they were in a static condition, and were not working. I did not apply any energy to any of these parts to function at the time of my testing.... I did not make any note of the particular dimensions of the looseness of contacts." But yet he insisted: "Actually, there was no looseness in those apparatus which were tested. The apparatus and cables were examined by applying physical force, and no looseness in connections could be found." But he admitted: "I did not mention these facts in my report as I considered these details would not be necessary."

58. I would prefer to rely upon the evidence of Welsh (witness No. 5 for the Court), to which reference has already been made, and I quote again:—

"The carbon brushes should not have been in the position in which they were found, if the motor had been properly maintained.

"The motor must have been running for some time prior to the explosion with the brushes touching, as the brush was worn to the shape of the slip ring.

"The brush-holder which was lying in a bent position should have been brought back to its original position in order to run the motor correctly.

"From what I had seen of that particular part of the motor I could say that the motor had been running in that condition for at least a few days, depending on the amount of work.

"There would be a tendency for one section of the resistance to heat more than normally due to this defective position of the carbon brushes."

From the above evidence, it is too apparent that the apparatus was being worked in a defective state. That was a serious matter, and cannot be overlooked.

59. The condition in which this apparatus was found after the explosion was that the controller was in the off position. It was argued that it would appear that the ignition took place as the controller was brought from the on position to the off position. Welsh gave his opinion that sparking in the controller would be inevitable when the electric circuit is broken, and, when the haulage is being switched off, there would be a large amount of sparking in the grid. The maximum amount of sparking would take place at the make and break of the circuit, and it seems to be not unlikely that, when the engine was switched off and the controller was brought in the off position, sparking would take place.

60. Was this engine working at the time?—This leads me to the next question whether the haulage engine was actually working at about the time of the explosion; for, if it was not so working, no spark could have been produced to cause ignition. It was suggested at the time of the argument that the engine had been probably stopped just before the explosion. It was pointed out, on the other hand, that it does not appear to have been the case of the Management in the written statement filed by them that this haulage was not working at the time. According to the evidence of the Assistant Manager, this haulage engine was examined by the Electrical Inspector and the Engineer of the mine about a week or ten days after the date of the explosion. And the Electrical Inspector of Mines said that, on the 9th February, 1955, he had inspected this engine but it was a superficial or merely a visual inspection. It was again on the 11th February that he paid a second visit to the mine in order "to gather further facts regarding the electrical installations". It does not seem to have suggested itself up to this stage at any time, nor does it appear to have been the opinion of either the Electrical Inspector of Mines or the Engineer of the mine, that the haulage was not working at the time of the explosion. In the present case, one would expect it to have been working, and this feature was strengthened by examining the condition in which the engine was found. The controller had been brought in the off position while the haulage rope capel had been taken out of the front tub hook and kept on one side of the gallery; the drag and the sprag, however, had not been taken out. It was, therefore, argued that it would seem that the tuhs had just been hauled up the brow by the engine; the controller was then put in the off position; the capel was taken out of the hook; and the sprag was put in the wheel, and then something happened, and the



remaining portion of the work, namely, taking out the sprag and the drag, was left unfinished. It was further pointed out that there does not appear to be any good reason for the supposition that, before the explosion, the engine had been switched off, for, if that had been so, the further procedure would have continued. The two witnesses, namely, P. C. Sarker, the Electrical Inspector of Mines, as also Guha, the Engineer of the mine, said in their evidence that, according to them, the engine was not working at the time of the actual explosion. Reliance was also placed upon the evidence of Welsh who said that he could find no sign of burning on the insulation of the leads leading out of the switching chamber into the cable joint box. He had, however, found a coating of black deposit over the motor case and in the inside of the motor housing, though he was unable to find any definite signs of explosion or burning inside the motor. With regard to the Empire tape and the slip ring brush-holder, Welsh said that he did not find any sign of sparking in the Empire tape; but he explained that he was not prepared to say whether it had been burnt or not, as, in common with the rest of the motor, it was covered with deposits. The reasons upon which Sarker based his opinion were (1) that the controller handle was in the off position, and (2) that the rope capel was found detached; and Guha added a third reason (3) that the haulage khalasi, who was at the controller on that day named Shashi Rajwar, was found lying dead at a distance of about 60 feet from the controller handle, so that it would seem that the khalasi had stopped the engine and had walked away from it, and it was then that the explosion took place. I do not think that the last reason can justify a conclusion that the engine had been stopped, and the khalasi had walked away from it. It was explained that it may also be that the engine was working, and, when Shashi Rajwar, the khalasi, became aware of the danger, he ran and then, as a result of the explosion, he fell down at the place where his dead body was found, about 60 feet away. There were found burns on his face and arms. Sometime, however short it may be, must elapse between the ignition and the explosion, as, according to the well-accepted rule, the flame travels towards the highest concentration and then explodes. The fact that the controller handle was in the off position is no sure indication that the engine had been stopped before the explosion. And, with regard to the rope capel, that would necessarily be taken off as the tubs cross the brow, as then the haulage engine could stop. The reasons given by these two witnesses for their opinion that the engine could not have been working at the time of the explosion do not appeal to me as sufficient for arriving at the conclusion at which they have arrived. The morning shift was to end at 4 P.M. Loaded tubs were being hauled up. It does appear that the haulage engine was working just before the explosion, and there seems no good reason to suppose that the engine had been stopped only a few seconds or minutes prior to explosion. Ordinarily, as I have said, one would expect the work to continue uninterrupted. I may repeat that the engine had hauled up four loaded tubs; the tubs had reached the brow; the controller was put in the off position; the rope capel had been removed; the shrag had been put in to act as a brake; and the drag which is at the back of the tub was also put in. When the tubs stop, the sprag is taken out; so has the drag to be taken out. This work had been interrupted. Ordinarily, this should have been done. Something interrupted the work, and this would be the time of the explosion. Accordingly, I cannot agree with the contention that the engine had, in fact, stopped working before the explosion.

61. But that does not solve the problem. The more difficult question is whether, even if the haulage engine was liable to give out open sparking, and even if it was working at the time, ignition was, in fact, caused by a spark therefrom. For this to happen, gas must reach the engine. For the proper ventilation of the engine, a hole was made in a stopping behind it to allow passage to the air going into the gallery where the engine was. Behind that hole is the affected area. Now, the theory put forward by the Deputy Chief Inspector of Mines (witness No. 1 for the Department of Mines) is that gas having accumulated behind that hole, it entered the gallery where the engine was through that hole and filled the gallery. The engine then having emitted a spark, a flame was produced which travelled back into the rise area, where there was maximum concentration, and then the explosion took place. It was argued for the Management that, even assuming that gas had accumulated behind the haulage engine, it could not pass through the hole and enter the gallery where the engine was because, through that hole, there was fresh intake air passing and gas, being a lighter than air, would be pushed back and would not be allowed to enter this gallery with the result that there could have been no gas round about the engine. Then the question of ignition by reason of a spark from the engine would not arise. The reply to this argument was that gas will diffuse itself with air, and the fresh air passing through the hole would not work like a piston

to keep the gas out. It is true that the fresh air passing through the hole would not work like a piston; but, at the same time, the firedamp behind the hole would have to work its way from the rise area downwards to the dip side in order to accumulate near the haulage engine. Even with a favourable current of air, an appreciably high velocity would be required for this purpose. This does not seem to have been the case. It is very likely that diffusion would occur under quiescent conditions which could have been created if there had been a stoppage of the main ventilator on the surface as, otherwise, the ventilating current flowing to the rise side past the haulage engine through the hole behind it will have a sufficiently high velocity to prevent the gas moving towards the haulage engine. There had been a suggestion at the inquiry that the Management were in the habit of stopping the main ventilator on the surface at each shift for a while in order to save electric current. If that be so, quiescent conditions would be created and diffusion of firedamp up to the haulage engine would be made possible. But no evidence was led to support the suggestion. Although quite a number of witnesses were cited on behalf of the Labour organisations, not one was examined. There is thus no material to find that the ventilator on the surface used to be stopped. The question of ignition, therefore, must remain in the realm of conjecture.

62. *The 60 H.P. Haulage engine was kept in its place in breach of the rules.*—Now, this much is clear that the haulage engine was a non-flame proof apparatus. It was only about 80 feet away from the sand-stowed area. It was not in the main intake airway but about 25 to 30 feet inside a gallery, off the main intake airway. There would be no danger if gas is cleared from the place where the engine had been installed, by adequate ventilation; but, as Whitaker has said, "If, due to the derangement of ventilation, gas accumulates in the vicinity of the 60 H.P. haulage, point out to me at the main dip haulage road, and if this apparatus is not flame-proof, it is dangerous." He is a perfectly independent witness. So is Welsh who too is of a similar opinion.

The resistance was of open grid type, and not flame-proof. The cover of the slip ring was also not flame-proof. According to Welsh, the cover of the controller was akin to flame-proof but not flame-proof. The possibility of open sparking is, in fact, admitted. And there is no knowing whether the air gap in the joints exceeded 0.02". To instal an equipment of this type would be a breach of rules 105(v) and 111(1) (b) of the Indian Electricity Rules, 1937.

Rule 105(v) is in these terms:—

"Switchgear and terminals.—Switchgear and all terminals, cable-ends, cable-joints and connections of apparatus shall be totally enclosed and shall be so constructed and installed as to comply with the following requirements:—

- (v) where there may be risk of igniting gas, coal-dust, oil or other inflammable material, all parts shall be so protected as to prevent open sparking;"

And rule 111(1)(b) is as follows:—

"Precaution where gas exists.—(1) In any part of a mine or oil-field in which inflammable gas or vapour whether normally present or not, is likely to occur in quantity sufficient to be indicative of danger, and in any working approaching such part, the following additional requirements shall be satisfied as regards all apparatus:—

- (b) all motors shall be so constructed that, when any part is live, all rubbing contacts (such as commutators and sliprings) are so arranged or enclosed as to prevent open sparking;"

That rule 111 applies to Amlabad mine is admitted by the Electrical Inspector of Mines, P. C. Sarker. There is a provision for relaxation of rules 105 and 111, as provided by rule 116; but there is no evidence of any such exemption having been obtained.

The electric installation in question was installed some twenty years ago, and has been there since. That was when the Indian Electricity Rules, 1922, were applicable, and the rule corresponding to rule 111(1) (b) of the Indian Electricity Rules, 1937, in the rules of 1922 is rule 99(b) which is in these terms:—

"In any part of a mine or oil-field or in any working approaching such part, in which inflammable gas or vapour, although not normally present, is likely to occur in quantity sufficient to be indicative of danger, the following additional requirements shall be satisfied as

regards all apparatus, including such apparatus as is working at low pressure:—

- (b) All motors shall be constructed, so that, when any part is live, all rubbing contacts (such as commutators and slip-rings) are so arranged or enclosed as to prevent open sparking."

In 1936, a circular, No. 10 of 1936 (exhibit C-31\*), was issued by the then Chief Inspector of Mines in India which is as follows:—

"I have the honour to invite attention to the fact that in safety lamp mines, non-flame proof electrical apparatus and open-type motors are ordinarily installed in situations which are not main intake airways and also near depillaring areas. Cases have occurred where firedamp has been expelled from goaf edges by falls of roof.

"To prevent any risk of an ignition of firedamp through a defect in electrical apparatus, it is necessary that, in areas such as those mentioned above, only certified and totally enclosed flame-proof apparatus should be installed. Reference may be made to Rule 99 of the Indian Electricity Rules, 1922.

"I shall be glad if, in future, attention is given to the above point."

The circular direct that, in situations which are not main intake airways and also near depillaring areas, only certified and totally enclosed flame-proof apparatus should be installed.

There is another circular, No. 1 of 1937 (exhibit C-32\*), which is in these terms:—

"I have the honour to invite reference to my circular No. 10 of 1936, dated 28th November, 1936, wherein I pointed out the necessity of using certified and totally enclosed flameproof apparatus in safety lamp mines in situations which are not main intake airways and also near depillaring areas.

"As there remains a serious risk of a sudden emission of firedamp in dangerous quantities from goaves in depillaring areas, it is essential for safety that all electrical apparatus which may be situated even in main intake airways within a distance of 700 feet from the nearest depillaring areas or the nearest goaf edges should also be of the certified and totally enclosed flameproof types, unless the goaves are effectively packed.

"All signalling instruments connected to bare signalling wires which may extend to above situations should be of the types approved by the British Mines Department and tested for intrinsic safety.

"I shall be glad if you would kindly arrange to give effect to the above matters as early as possible."

Here, again, the direction is that all electric apparatus installed even in main intake airways within a distance of 700 feet from the nearest depillaring areas or the nearest goaf edges should also be of the flame-proof type, unless the goaves are effectively packed. It must be remembered that the present electrical installation is only 80 feet from the goaf.

63. The Electrical Inspector of Mines ought not to have, in my opinion, in the present circumstances, allowed the continuance of this electric apparatus at the place where it was even on the terms of those circulars. Rule 99 of the Indian Electricity Rules, 1922, provided against it, and so does the present rule 111 of the Indian Electricity Rules, 1937.

64. The Electrical Inspector of Mines, P. C. Sarker (witness No. 3 for the Court), was questioned with regard to the two circulars. He said that, while permitting the continuance of electric installation at the place where it is, he did not check the ventilation. He, in fact, as he admitted, had not checked the ventilation of the Amlabad mine ever since he took over charge in 1948, by means of any instrument. He never consulted the air measurement book either. He admitted that he had no idea as to how far away was the stowed area on the rise side from the place where the present 60 H.P. haulage installation exists. He had never seen the stowed area at all before the explosion. He said that, so far as the requirement of the goaf being effectively packed and so far as the situation of the main intake airway, as required by the circulars, are concerned, he depended

\*Not printed.

upon the information supplied to him by the colliery authorities, namely, the Manager. The information was supplied to him verbally, and he did not verify its correctness. The information was given to him about six years ago by the then Manager; but even thereafter he never checked up. The Electrical Inspector said that there was nothing either with him or in his office to indicate that, during those six years, he had made any checking with regard to the conditions required by these circulars. The witness said that he had asked the Manager if there was any danger from gas from any near about area, and, when he was told that there was none, he accepted the statement. That was all the enquiry he had made. He said that he did not ask the Manager either about the existence of any goaf area or the distance of such an area from the place where the 60 H.P. haulage installation was. He did not ask him about the effectiveness of the packing of any goaf. He never saw the goaf area. During the last six years, he had made no enquiry from any one either about the existence of any goaf area or its packing, nor has he made any enquiry regarding the ventilation at the point where the 60 H.P. haulage installation is. The last time he made his inspection before the explosion was in 1950. Although he said that he inspected the installation, he admitted that there was no examination or testing of those installations at that time. He explained that by inspection he meant that he "just saw the installation from outside and nothing more than that". Under rule 115 of the Electricity Rules, all facts of inspections have to be mentioned in the log book, and the log book is checked by the Electrical Inspector as well. The last time he saw the log book was in 1950 when he had visited the mine. He made the admission that he felt the necessity of making more frequent inspections in gassy mines by the Inspectorate as also of more detailed and careful examination of the installations, but he said: "Unfortunately, the work of the Mines Electric Inspectorate is very heavy, and sufficient time could not be devoted. I have to inspect 500 mines electrified throughout the country with the assistance of two junior officers". One of the junior officers, N. P. Ghosh, had visited the Amlabad mine in 1952, and, when the witness was asked why it was not inspected again either by himself or by one of his junior officers, he said: "It was due to pressure of work in other directions, and I was also on leave in the year 1954 for four months". Surely, a period of three years is too long for electric installations to be left uninspected in a gassy mine. Many defects are likely to occur within this period, and it would be serious, if the machinery be not properly maintained. The risk of ignition by electricity remains high despite the restrictions of its use to workings where the firedamp content of the air is of a certain percentage and despite the effective requirement that electrical equipment intended for use must either be intrinsically safe or flame-proof. In almost every case, ignition by electrical equipment of modern design has been ascribed to obvious bad maintenance or misuse.

66. My conclusions, therefore, in this respect are that the 60 H.P. haulage in should have been. His inspections were very infrequent, and they amounted to nothing except just seeing the installation. He had not complied either with the circulars mentioned above or with the provisions of the Indian Electricity Rules, 1937. Had he done so, the danger of keeping the installation in its present position would have been surely realised, and steps would have been taken to avoid an accident of the type which is the subject-matter of the present inquiry. I would not be inclined to accept the report of this Electrical Inspector, without very strong corroboration and good reasons, that the electrical installation could not have given out any spark. He had not exercised sufficient care. The blame would certainly have had to be shared by him for the accident, if the explosion had taken place as a result of a spark from the electrical apparatus.

68. My conclusions, therefore, in this respect are that the 60 H.P. haulage in the main dip area was liable to give out open sparking within the meaning of rule 2(1)(x) of the Indian Electricity Rules, 1937. As such it should not have been allowed to remain at that place. I am also of the opinion that the haulage engine was working at the time of the explosion. Whether, however, ignition was caused by a spark from this engine is a matter on which no easy conclusion can be arrived at. It is not often that there is immediate and clear-cut evidence of the means of ignition of an explosion. The general investigation narrows down the possible sources. Only thus can the explosion be reconstructed with any assurance; but in the present case, on the materials available, it has not been possible to come to any definite conclusion, and it must remain conjectural.

#### VII—POINT OF ORIGIN OF THE EXPLOSION

67. One matter which also required investigation was regarding the point of origin of the explosion. It is not in dispute that the point of origin of the explosion was somewhere in the rise area which may be roughly said to be towards the

north, whereas the dip side is towards the south. All stoppings were found to have been thrown towards the dip side. I have found that there was derangement of ventilation and consequently accumulation of gas, because the main intake air was short-circuiting through the door behind the endless haulage. This door is towards the north of the main intake airway. Roughly, towards the west of the door behind the endless haulage in the rise area is the return airway. The air which was short-circuiting through that door was going along the return airway towards the west. It could not be going towards the east. The air which will come to the eastern side would pass through the third split, that is, along the goaf area. This area was the area where accumulation of gas must have been the maximum because of inadequacy of ventilation. Hence, I would assume that the accumulation of gas was the worst between the goaf area and the door behind the endless haulage. The Electrical Engineer of the Amlabad mine said that, according to him, the explosion took place in the gallery which runs parallel to the south main level behind the 60 H.P. haulage. After the explosion, the hot blast and violence travelled very much beyond that place. It came with a great force at the place where the endless haulage was, as almost the whole machinery was thrown as under. Thus, the point of origin of the explosion must have been somewhere behind the endless haulage.

68. No argument to controvert the above conclusions was addressed to the Court. But I think it is necessary to deal with the opinion expressed by S. C. Ghosh (witness No. 7 for the Court). He would locate the seat of explosion immediately to the south of the gallery marked II where six dead bodies were found as indicated in the small map (Appendix IV\*). This place, being to the west from the door behind the endless haulage, is in the return airway and thus was being sufficiently ventilated. It seems to be most unlikely that accumulation of gas could take place there. However, that is the theory of Ghosh. He spoke thus: "The gas had its ignition at some point which of course I have not been able to locate, but after having the ignition it travelled to the place which is marked as W-1 on the plan exhibit M-1\*. Having exploded at that point, the flame travelled all over in the entire area which has been affected by this explosion". W-1 is just south of the gallery marked II, and it is a point falling directly in the return airway. At that place, as also indicated on the small map, shovels and picks were found lying since work was in progress there. When cross-examined on these lines, Ghosh said:—

"I have gone inside the heading marked II on plan M-1\*. There was no mark of violence in that heading. I had gone up to the end of the gallery. No mark of violence was found inside that gallery because it is a blind end.

"If the force of the explosion had gone inside the blind end of the gallery of heading II and returned then the shovels would not have been found at the place where they were found, as they would have been blown away as also the dead bodies."

When further pressed in his cross-examination, Ghosh saw the inconsistency in his evidence, and said:—

"This last statement would appear to be somewhat contradictory from my previous statement. But the explanation is that, when the explosion took place, the pressure was built up in the closed area as well as the area where the dead bodies were found simultaneously, and the force came out by the path of the least resistance."

Examining the circumstances as a whole, I do not think that I can rely upon the theory expounded by Ghosh in respect of the seat of explosion. I have not been able to accept his theory regarding ignition having taken place by reason of some miner opening a safety lamp for purposes of smoking. Although examined as a witness for the Court, he has identified himself with the Management to such an extent that he cannot be considered as being disinterested in the Management, and thus wholly independent. He admitted:—

"I know that it had been suggested before this Court of Inquiry that there was derangement of ventilation due to air short-circuiting on account of the opening of a door behind the endless haulage.

"I also knew that it was suggested that ignition took place at the 60 H.P. main dip haulage.

"If my opinion that the seat of explosion was at W-1 on plan M-1\* be correct, then the question of air leakage through the door at the back of the

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\*Not printed.

endless haulage as also the question of the sparking of the 60 H.P. haulage engine would become immaterial."

And the Management is at once relieved of all responsibilities for the accident. I find myself unable to accept Ghosh's opinion.

### VIII—SUMMARY OF CONCLUSIONS

69. In the morning shift of the 5th February, 1956, miners were sent to work in the rise area which had not been worked, except for driving two galleries, till the end of December, 1954. It was a dangerous area in the sense that the mine is a gassy one and one gallery had been driven up to a fault while the other met a jhama. Although the evidence is that miners used to be sent to work in that area, when there was a surplus; yet, on that day, though there was paucity of miners, a number of them were sent there. Even then, if care had been taken for adequate ventilation, the accident may have been avoided; but, owing to the absence of an attendant at the door behind the endless haulage, the door had been constantly kept open, thus allowing short-circuiting of intake air and deranging the ventilation. This resulted in accumulation of firedamp in the rise area. The 60 H.P. haulage main dip was non-flame proof and liable to give spark. It should not have been there. But it is questionable if gas accumulated round about this haulage engine. The accumulated gas was ignited, but it has not been possible to find the source of ignition. There was a firedamp explosion. And I think that, in this firedamp explosion, coal-dust has also taken part. Signs of coking were found at the time of the inspection of the mine. An inspection note submitted by the Chief Inspector of Mines in respect of the first inspection made by the Court of Inquiry is attached as Appendix V. Dead bodies were found covered with coal-dust. Coking is an indication that coal-dust had taken part. The explosion was of great violence and caused enormous damage, throwing over tubs, switch-gears, cables, sand-pipes, etc. These had been lifted from their original positions and were lying against the dip side pillars. Such was the condition in the main intake airway. Firedamp explosion would ordinarily be confined to working places and the return airways, but a coal-dust explosion would very probably extend to the intake airways, even though it did not originate there, for the reason that intake airways, being generally main haulage roads, are those in which the most inflammable kind of coal-dust will accumulate.

### IX—GENERAL OBSERVATIONS

70. The responsibility must primarily rest upon the Management. Supervision was lax. It was when the new Management took over the colliery that the two stoppings in the gallery marked I and II on the plan, exhibit M-3\*, were removed, and working was started in the rise area which, as I have pointed out, had been abandoned. The Manager had himself seen men working in the rise area on the 4th February, 1955, and took no action. It would appear from the note made on the 5th February, 1955, in his diary (exhibit 3\*) that he was clearly of the opinion that men should not have been sent to work in that area. There must have been good reasons upon which that opinion was based. I gather that one reason must have been that that was not a safe area unless good and sufficient precautions had been taken. And, on the 5th February, 1955, instead of taking precautions, there was utter neglect in seeing that the ventilation was proper and adequate. The result was that the ventilation was deranged and gas accumulated in the rise area by reason of short-circuiting of the intake air through the door behind the endless 60 H.P. haulage. It may well be that had proper precautions been taken, the accident may have been averted. It ought always to be borne in mind that the lives of so many men working underground are involved and an official whose duty it is to see to precautionary measures must be vigilant. In the present inquiry, it has been found that, but for the door behind the endless haulage having been allowed to remain open, nothing may have happened. If only a door attendant had been posted here, according to the practice as it is now said, the accident may have been averted and the lives of 52 men may have been saved.

There was lack of supervision by the supervisory staff of the Department of Mines. A. C. Bose (witness No. 2 for the Department of Mines), the Assistant Chief Inspector of Mines, had last inspected the mine in May, 1954, and no inspection appears to have been made since, although he admitted: "My Department looks upon gassy mines with some amount of vigilance and care". Inspections of gassy mines ought to be more frequent, more effective and more rigid. If need be, the supervisory staff should be increased. Had there been more

\*Not printed.

frequent inspections with adequate attention, bearing in mind that it was a gassy mine, I have no doubt that better safety precautions would have been adopted.

Similarly, the inspection of the electric apparatus by the Electrical Inspector calls for comment. His inspection, on his own evidence, was much superficial: at one place he described it as just "visula". He should have borne it in mind that he was permitting the use of non-flame proof apparatus in a gassy mine and this demanded greater care on his part. He should not have permitted the use of non-flame proof apparatus (the 60 H.P. main dip haulage) in that part of the mine. In my view such permission was contrary to the various provisions of the Electricity Rules. Stricter supervision is called for from the Electrical Inspector.

#### X—VIOLATIONS

71. The following rules and regulations do not appear to have been observed:—

*Electric apparatus.*—(1) Rule 105(v) of the Indian Electricity Rules, 1937, which provides that, where there may be risk of igniting gas, coal-dust, oil or other inflammable material, all parts of an electric apparatus shall be so protected as to prevent open sparking, has not been complied with.

(2) Rule 111 (1) (b) of the Indian Electricity Rules, 1937, which provides that in any part of a mine in which inflammable gas is likely to occur in quantity sufficient to be indicative of danger, all motors shall be so constructed that, when any part is live, all rubbing contacts (such as commutators and slip-rings) are so arranged or enclosed as to prevent open sparking, has not been complied with.

(3) The supervision required under rule 115 of the Indian Electricity Rules, 1937, was not in accordance with that rule.

*Circulars.*—The directions given in Circular No. 10 of 1936 and in Circular No. 1 of 1937 issued by the Chief Inspector of Mines in India were not carried out.

*Coal Mines Regulations.*—(1) According to regulation 70(2) of the Indian Coal Mines Regulations, 1926, the endless rise area, where, admittedly, extraction of coal was taking place, should have been inspected, and the result of such inspection should have been recorded in a book kept at the mine for the purpose. There is no record of any inspection of this area.

Inspections as required by regulation 70(3) do not appear to have been made either.

(2) Regulation 70-B(1) requires that, in any mine in which inflammable gas has been found during the previous twelve months, all unused workings in which inflammable gas may accumulate and which are not permanently sealed off, shall at least once in every week be inspected for the presence of inflammable gas. In the rise area, where the explosion has occurred, there were galleries left abandoned but not sealed off. The endless haulage area was not inspected as required by this regulation.

(3) The provisions of regulation 77(4) have not been observed. The Manager said that the width of the gallery in the rise workings varies between 10 and 16 feet. According to regulation 77(4), the distance between centres of adjacent pillars shall be between 55 and 85 feet. But, according to the Manager, in the drivage marked L on the plan exhibit M-1, the average width of the galleries is 12 feet to 14 feet, and the newly-formed pillars along this drivage are 45'×72' and 28'×45'.

(4) Regulation 116-A(c) provides that in a mine, in which the use of permitted explosives is required by these regulations, no shot shall be fired in coal in any galleries unless: (1) the coal has been under cut, over cut or side cut, and (2) the length of the shot hole is at least six inches less than the length of the cut. There appears to have been a violation of this regulation. It will appear from paragraph 20 of my report that solid blasting was being resorted to. Indeed, Surajballi Missir (witness No. 4 for the Management) made this admission: "As far as I know, solid blasting was not done; but, on an examination of the holes, it appears that solid blasting had been done."

(5) Regulation 122(1)(ii) requires that, in every mine in which inflammable gas has been found within the previous twelve months, the quantity of air shall at least once in every month be measured in every split, as near as practicable, to the point at which the split commences. This was not done in the split which has been called in the inquiry as the third split, that is to say, the main south level rise section. This was a serious omission, inasmuch as, according to my

findings, it was as a result of derangement in ventilation of air going into this third split that the accident occurred.

(6) Regulation 126 requires that all safety lamps in ordinary use shall be numbered, and such record shall be kept of the persons to whom the lamps are issued that the user of any particular lamp can at any time be identified from the record; and, according to regulation 127(e), the Manager or a competent official appointed by him for the purpose, shall examine all safety lamps in use at least once in every week, and the result of his examination has to be recorded in a book kept for the purpose. It appears from the Lamp Register that this weekly examination was not done at least in respect of the week commencing from the 24th January, 1955. The Lamp Register has been very carelessly kept, as will be found from the comments which I have made in paragraph 44 of my report.

*Coal Mines Rescue Rules.*—The Manager has stated that the total number of persons working in the mine is 1,200. Therefore, according to rule 34 of the Coal Mines Rescue Rules, 1939, there should be at least three persons trained in rescue work; but the Manager stated that the Management have only one such person.

### XI—RECOMMENDATIONS

72. Innumerable suggestions and recommendations on the subject of avoidance of accidents have been made; but the progress made towards a lessening of the number of accidents is disappointing.

1. I would wish my first recommendation to be what I may call "Safety First Campaign". People connected with mining operations should be made aware by intensive and extensive methods of advertisements, pictures, lectures and the like, of the kinds of dangers to which they may be exposed by carelessness, and how to prevent them. It may possibly be useful to form "Safety Committees" consisting of representatives of the officials and workmen in order to make persons connected with mining operations aware of the dangers and their preventions.

2. The early stages of an investigation are necessarily hampered by the more urgent needs of exploration, rescue and recovery; but, at the same time, it is important that no vital evidence should be lost or destroyed during these operations. A "Special Investigation Team" may follow, as closely as possible, without interfering with the recovery operations. Its work will probably be hampered to some extent by the immediate need on hand, namely, rendering the mine safe and recovery of men, dead or alive. But such difficulties may be lessened by co-operation and systematic planning. Early collection of evidence is necessary. In the course of the present inquiry, we found that the condition of the 60 H.P. main dip haulage was not examined soon after the explosion; for, if that had been done, it may have been helpful in determining its condition before the explosion. The desirability of inspecting the condition of ventilation by a Mining Engineer and the condition of electric apparatus by an Electrical Engineer (both unconnected with the Management and the Department of Mines) immediately after an accident should be realised; otherwise much valuable evidence is likely to be lost for a Court of Inquiry.

3. The use of flame-proof apparatus should be made compulsory in every part of a gassy mine.

4. In gassy mines, electric safety lamps are less liable to misuse in the hands of less responsible persons, and their use by all persons except the supervisory and the inspecting staff should be made compulsory in preference to the flame type of lamps.

5. Old workings in gassy mines, and particularly places in which inflammable gas may accumulate, should be examined at least once a week by a competent person, and the results recorded in a book kept at the mine for the purpose.

6. In a gassy mine, the air current ventilating a goafed area, whether packed or unpacked, and disused workings should not be allowed to ventilate the working places unless permitted by the Chief Inspector of Mines.

7. Danger of accumulation of inflammable gas anywhere in a mine is always a serious matter, and it becomes a lively hazard if it is near, or if it may react upon, a working place, or if it be near any possible source of ignition. In such an event, the matter should receive the careful consideration of the higher Management who should decide what is to be done about it, and the agreed policy should be made clearly known to the under-officials in charge in the area. The



operation should only be done on a well-considered plan and under the close supervision of a superior official.

8. Any change in the system of ventilation in a mine where safety lamps are required to be used should at once be notified to the Inspector of Mines.

9. Whenever possible, the installation of auxiliary fans should be avoided, and steps should be taken instead to ensure that the general ventilating current of the mine is adequate. But, if a fan has to be installed, whether on the surface or underground, provision should be made in the Regulations to the effect that, for installation of fans or their removal or change of site, the previous sanction of the Chief Inspector of Mines; or any other competent officer, shall be necessary.

10. Provision should also be made in the Regulations that, for any major change in the ventilation system, the previous approval of the Chief Inspector of Mines should always be taken except in certain emergency cases where discretion may be left to the Manager who shall forthwith intimate the changes made to the Chief Inspector of Mines.

11. Since sand-stowing is the common method of stowing goafed area, it seems desirable that a committee should be appointed for making a research generally and to examine the question of shrinkage of sand resulting in roof-falls. In "Transactions of the Mining, Geological and Metallurgical Institute of India, Volume 45, No. 4, January 1950" at the top of page 156, it is stated as follows:—

"As the stowing material is sand, the phenomenon known as 'bulking' may have an effect in the underground packs. Sand, whether dry or saturated, occupies the same volume, but in any intermediate stage the volume is increased. Thus an originally perfectly saturated coarse sand pack may increase in volume by 10 per cent. when the water content is reduced to 4 per cent. Investigation as to how far this applies to underground packs is necessary. Generally water drains off sand packs for 10 days after stowing."

During the present inquiry, opinions differed regarding shrinkage of sand. It seems to be important that this question should be examined more closely.

12. Provision should be made in the Regulations that, save in emergency, no instructions with regard to matters concerned with the working of the mine should be given to any person employed in the mine except by, or under the authority of, or in consultation with and through, the Manager.

13. Provision should be made in the Regulations for fixing the minimum qualification for a person to be appointed an "underground sirdar", "incharge", "overman" or "munshi". The minimum qualification provided may be that of a Matriculate or some equivalent educational qualification.

14. A labour representative should be permitted to go underground and inspect the places where miners work, in order to afford additional safeguard for their safety.

15. I have commented upon the irregular inspections by the Mines Inspectorate as well as by the Electrical Inspector. I have the impression that there is lack of co-ordination between them. There ought to be complete co-ordination between the two in order to avoid, or, at least, minimise dangers of explosion of inflammable gases igniting from electrical sources. It is the Mines Inspectorate which ordinarily tests for inflammable gases in the mine, and they come to know the varying conditions in the mine. This information ought to be made available to the Electrical Inspector in order to take and adopt necessary safety precautions in the matter of electrical installations. Or, the Electrical Inspector of Mines may be brought under the Chief Inspector of Mines, so that both sets of these officers may co-ordinate to ensure safety in mines.

16. Provision in the Mines Act may be made making it obligatory upon the Mines Inspectorate to inspect every mine at least once a year; and more frequently, in the case of gassy mines. No such provision was brought to my notice in the inquiry, and all that the present provisions do is to given them power to inspect but cast no duty upon them to inspect at certain intervals.

17. An Inspector ought to be a person of experience. He should have experience of five years at least as Manager, and then made an Inspector.

18. It is necessary to increase the number of Mines Inspectors.

19. Appointment of Assistant Managers in large mines should be made on a prescribed scale as to number and depending upon the monthly output of the mine.

20. A regulation should be added in the Indian Coal Mines Regulations, 1926, preferably after regulation 25 in Chapter III of the Regulations, to the effect that no mine shall be worked unless daily personal supervision in respect of the working is exercised by the Manager, and, during the period of his absence, by a person authorised by him as under regulation 24(3), and a record of it should be kept in the manner prescribed.

21. *Regulation 121(1)*—This regulation requires constant production in every mine of "an adequate" amount of ventilation to dilute and render harmless inflammable and noxious gases, etc. Comment is often made as to what would be "an adequate" amount of ventilation. Section 29(1) of the English Coal Mines Act, 1911, deals with the standard of ventilation and there is similar vagueness. The Report of the Royal Commission of Safety in Coal Mines of the year 1938 has commented on this question at pages 208 and 209. It recites that the Royal Commission on Mines in their Second Report (1909) pointed out that the General Rule as to ventilation then in force (which was incorporated in section 29(1) of the Coal Mines Act, 1911) "prescribes no definite standard, and that in each case it is ultimately left to a Court of Law, on proceedings being instituted, to determine whether the rule is complied with or not". The Report then proceeds as follows:—

"The Commission reported that difficulties had been experienced in proving breaches of the rule, and figures were given to show that prosecutions for inadequate ventilation had failed more often than in the case of other breaches of the Acts. The Commission came to the conclusion 'that it should be rendered legally obligatory that every reasonable endeavour should be made to maintain such a standard of ventilation as to prevent the appearance, in any open and readily accessible position, of a fully formed cap on the lowered flame of an ordinary safety lamp, burning the oil in common use, and that men should not be allowed to work or pass when this standard is exceeded'. But they deferred saying what percentage of firedamp was sufficient to produce a fully-formed cap, pending further inquiries. In their Third Report (1911), after those further inquiries had been made, the Commission came to the conclusion that it was not possible to define in more precise terms what constituted 'adequate' ventilation, 'which must be interpreted according to the best mining knowledge of the day', and that all they could do was to recommend the fixing of a definite percentage of firedamp at which workmen must be withdrawn.....".

The difficulty to define in more precise terms what constituted "adequate ventilation" is realised; but, at the same time, I think that the wording of regulation 121(1) may, if practicable, be made more definite. In this connection, reference may also be made to section 55 of the English Mines and Quarries Act, 1954.

22. *Regulation 122*—Provision should be made in the Regulations on the lines suggested by the Royal Commission on the Safety in Coal Mines in its Report (1938) at page 227 which I quote:—

"We propose therefore that in addition to being measured at the downcast shaft and in every split at the point where the split commences, the quantity of air should be measured, at least once in every month, at or as near as practicable to a point ten yards back from the first working place at the working face which the air enters, and at or as near as practicable to a point ten yards on the return side of the last working place at the working face which the air leaves. In either case the district inspector should have power, if circumstances render it desirable, to substitute some other distance for the ten yards. If there is more than one face or section of work in the ventilating district, the measurements should be made at the corresponding points in respect of each face, if worked longwall, or, if worked otherwise, at such suitable points as shall be fixed by the manager, with the approval of the district inspector."

23. *Regulation 134*—In this Regulation, provision may also be made for the appointment in writing of door attendants to attend to doors, the opening of which may lead to derangement of ventilation.

24. *Regulation 135(1)*—This regulation prohibits a person from having in his possession inside a mine, in which the use of safety lamps is required, amongst

other things, "somking apparatus". The term is rather vogue, and the intention ought to be more clearly expressed.

25. Regulation 135(2)—This regulation requires the search of "all persons employed below ground" before entering the mine. Literally, it provides for the search not of all persons entering the mine but of only such persons as are "employed below". For instance, a visitor would be excluded from the search. The regulation should include all persons going below ground. The corresponding provision in the English Coal Mines Act, 1911, section 35, is more clear.

26. An additional chapter may be added to the present Coal Mines Regulations, 1926, containing "Special Provisions regarding Gassy Mines", and, in it, provisions may be made (a) for the appointment of a special ventilating and safety Engineer whose duty should be to supervise the maintenance of the ventilation system; (b) for periodical sampling and analysis of the air in each district by an approved apparatus capable of giving readings on the spot; (c) for providing automatic firedamp detectors; and (d) for permanent installation of gas alarm in such parts of the mine where there is suspected danger of presence of gas.

27. A National Commission ought to be appointed at an early date, and at intervals thereafter, as Royal Commissions are appointed in England, to inquire "whether the safety and health of mine workers can be better ensured by extending or modifying the principles or general provisions of the Indian Mines Act, 1952, and the regulations and rules made for coal mines or the arrangement for their administration, having regard to the changes that have taken place in organisation, methods of work and equipment since they became enforceable and experience gained, and to make recommendation".

## XII—ACKNOWLEDGEMENT

73. The Chief aim of an inquiry of this nature is to ascertain what did happen and what led to that event and this with a view to eliminating that cause in the future. It is too obvious that, during such an inquiry, personal feelings and emotions inevitably make appearance and attempt to interfere with the work of a Court of Inquiry. At the same time, it is readily realised that the value of such an inquiry is great: not only does it unfold the probable causes of the present happenings, it makes one alert for the application of accepted precautionary measures in the day-to-day workings. And in the present inquiry, I cannot conclude this report without putting on record the Court's appreciation of the manner in which the parties to the inquiry conducted themselves all through the proceedings. Messrs. Brajeshwar Prasad Sinha and S. C. Banerji, the two Advocates who appeared at this inquiry, as also Messrs. S. S. Grewal and G. S. Jabbi, the Chief Inspector of Mines in India and the Deputy Chief Inspector of Mines in India respectively have rendered able, valuable and willing assistance to the Court. The inquiry concerned many technical matters and the two learned Advocates, Messrs. Brajeshwar Prasad Sinha and S. C. Banerji, put in much labour and industry in the study of the subject and argued the points with great lucidity. There has been anxiety on the part of every one concerned to place all the materials available before the Court with fairness and frankness, and this has been a great encouragement to examining the questions raised with interest and thoroughness.

However much labour be required in the investigation, however much personal feelings may be hurt in the course of it, however much time be taken over it, I am certain the trouble taken is well worth it. A complete uncovering and understanding of the cause of such a disaster and the circumstances leading up to it, however painful it may be, is necessary for the satisfaction of all concerned, and is a guide and inspiration to the safety in the future.

I appreciate the desirability of quick and early inquiry in such matters, otherwise evidence is liable to be lost or suppressed. This inquiry concerned many aspects and the questions raised assumed much importance. Evidence had to be led upon them, and I am happy to say that every party to the inquiry placed all available materials to enable the Court to finalise the report. The report thus covers many details which had to be examined somewhat critically and minutely, and this will be evident from the length of the report.

The 26th September, 1955.

(Sd.)

## EXPENSES OF THE INQUIRY

It now remains to be considered whether the Management should be ordered to pay the expenses of the inquiry. A prayer has been made on behalf of the Labour organisations that such an order should be made by the Court of Inquiry. The jurisdiction of the Court to make such an order has not been challenged.

The rule with which we are concerned reads as follows:—

“If a Court of Inquiry appointed under section 21 of the Act finds that the accident was due to any carelessness or negligence on the part of the management, the Court may order the owner, agent or manager of the mine to pay all or any part of the expenses of the enquiry, and the amount so directed to be paid may, on application by the Chief Inspector or an Inspector to a Magistrate having jurisdiction at the place where the mine is situated or where such owner, agent or manager is for the time being resident, be recovered by the distress and sale of any moveable property within the limits of the Magistrate's jurisdiction belonging to such owner, agent or manager.”

This rule was made by virtue of the powers conferred by section 30 of the Indian Mines Act, 1923 (IV of 1923). The Indian Mines Act of 1923 was replaced by the Indian Mines Act of 1952. Section 58 of the present Act of 1952 corresponds to section 30 of the repealed Act of 1923. No rule has been framed under section 58 of the present Act. But, by virtue of the provisions of section 24, General Clauses Act, 1897 (X of 1897), the rule quoted above is still in force and the Court may exercise its powers in appropriate cases. It has been found that the accident was due to the negligence on the part of the Management. It is, therefore, ordered that the owners, Messrs. Karam Chand Thapar & Bros., Ltd., do pay the expenses of this inquiry.

Dated 26th September, 1955.

(Sd.) B. P. JAMNAR,  
Court of Inquiry.

#### APPENDIX I

##### LIST OF WITNESSES EXAMINED AT THE INQUIRY

##### *On behalf of the Management*

1. Jagat Ram Sharma, Mining Engineer and agent, Bhowra Colliery.
2. Kumud Dutt, Manager, Amlabad Colliery.
3. Bande Ali Mian, Trolleyman.
4. Surajballi Missir, Underground-in-charge.
5. Shyamapada Bhaumik, a Shot-firer.
6. Santosh Kumar Mazumdar, Under-ground Mining Sirdar.
7. Nirmal Kanta Chatterji, Assistant Manager, Amlabad Colliery.
8. Ajit Bandhu Guha, Engineer, Amlabad Colliery.

##### *On behalf of the Department of Mines*

1. G. S. Jabbi, Deputy Chief Inspector of Mines in India, Dhanbad.
2. Amal Chandra Bose, Assistant Inspector of Mines, Dhanbad.

##### *Court Witnesses*

1. William Mitchel Burch, Superintendent of Collieries, Macheill & Barry, Dissergarh.
2. William John Wright, Assistant Manager, Lodna Colliery.
3. Phanindra Chandra Sarker, Electrical Inspector of Mines, Dhanbad.
4. Naba Prasuna Ghosh, Junior Electric Inspector of Mines, Dhanbad.
5. Kenneth John Welsh, Supervising Engineer for Andrew Yule & Co.'s Collieries.
6. J. W. Whitaker, Officer on special duty, Fuel Research Institute, Jealgora.
7. Satish Chandra Ghosh, Superintendent of Collieries, Tata Iron & Steel Co.
8. C. R. Bose, Surveyor, Dighwadih Colliery.
9. Ramadhar Singh, A.S.I., Chandankiary P.S.
10. N. P. Singh, Assistant Manager, Bhowra Colliery.
11. Gopi Jiban Banerji, Assistant Manager, Jamadoba Colliery.
12. Shyam Bhari Tewari, Mining Sirdar, Dighwadih Colliery.
13. Shankar Balajee Ashtikar, Senior Inspector in the Mines Rescue Station, Jharla.

14. Ganesh Chandra Mukherji, Superintendent of the Mines Rescue Station, Jharla.
15. Dr. Amiya Ranjan Ray, Chief Medical Officer, Bhowra Hospital.
16. Dr. T. D. V. Krishnan, Superintendent, Central Hospital, Dhanbad.
17. Dr. Charu Chandra Chaudhury, Assistant Medical Officer, Bhowra Hospital.
18. S. N. Ramanathan, Assistant Chief Inspector of Mines, Dhanbad.
19. Birendra Nath Mukherji, Junior Inspector of Mines, Circle No. I.

APPENDIX II  
LIST OF CASUALTIES

Serial No.	Name	Occupation.
<i>Killed</i>		
1.	Jhagru Rajwar . . . . .	Trammer Sirdar
2.	Bira Bhar . . . . .	G. P. Miner
3.	Misri Bhar . . . . .	Do.
4.	Dhaneshwar Bhar . . . . .	Do.
5.	Bhola Bhar . . . . .	Do.
6.	Ramkishan Chamar . . . . .	Do.
7.	Prabhu Bhar . . . . .	Do.
8.	Jugal Mahata . . . . .	Timber Mistry.
9.	Satya Narayan Mukherjee . . . . .	Munshi
10.	Sristi Singh . . . . .	Mining Sirdar
11.	Kali Rajwar . . . . .	Trammer
12.	Khetu Rajwar . . . . .	Underground Trammer
13.	Sudama Ahir . . . . .	G. P. Miner.
14.	Harif Chamar . . . . .	Do.
15.	Sahcbjan Mian . . . . .	
16.	Sarveshwar Rajwar . . . . .	Trammer
17.	Kalipada Rajwar . . . . .	Trammer
18.	Sukdeo Bharg . . . . .	G. P. Miner
19.	Bhugalu Pasi . . . . .	Do.
20.	Ram Nagina Ahir . . . . .	Do.
21.	Mithu Bhar . . . . .	Do.
22.	Thakur Chamar . . . . .	Do.
23.	Paroon Bhar . . . . .	Do.
24.	Sashi Rajwar . . . . .	Haulage Khalasi
25.	Bhagon Bhar . . . . .	G. P. Miner
26.	Rameshwar Bhar . . . . .	G. P. Miner
27.	Thag Chamar . . . . .	Do.
28.	Bikrama Chamar . . . . .	G. P. Miner
29.	Surujbali Chamar . . . . .	Do.
30.	Chulli Chamar . . . . .	Do.
31.	Paltan Chamar . . . . .	Do.
32.	Barsati Sai . . . . .	Do.
33.	Baleswar Bhar . . . . .	Do.
34.	Naurangi Chamar . . . . .	Do.
35.	Baburam Ahir . . . . .	Do.
36.	Budhu Chamar . . . . .	Do.

Serial No.	Name	Occupation
<i>Killed—contd</i>		
37.	Khelu Mahata . . . . .	Line Mistry.
38.	Chandradeo Chamar . . . . .	G. P. Miner
39.	Piaray Garari . . . . .	Do.
40.	Rajbahadur Prosad . . . . .	Driller
41.	Kalebar Mahata . . . . .	Underground Dresser
42.	Dhanpat Dosad . . . . .	Trammer
43.	Rajaram Rajwar . . . . .	Tub-repairing Mistry
44.	Ram Ranjan Majhi . . . . .	S. F. Helper
45.	Jadab Chakravarty . . . . .	Munshi
46.	Durga Das Chatterjee . . . . .	Shot-firer
47.	Hari Ram Rajwar . . . . .	Trammer
48.	Bunilal Dusad . . . . .	Driller
49.	Himanga Singh . . . . .	Timber Cooly
50.	Santu Rajwar . . . . .	Underground Trammer
51.	Tapeshwar Rewari . . . . .	Mining Sirdar.
<i>Injured</i>		
1.	Bande Ali Mian . . . . .	Trollyman.

## APPENDIX III

## DETAILS OF THE RESCUE OPERATIONS

Mines Rescue Station, Jharia.

Dhansar the 7th March, 1955.

Ref. No. RS/3747

To,

The President,  
Rescue Stations Committee, Dhanbad.

DEAR SIR,

REG:—*Recovery operation at Amlabad Colliery after an explosion on the 5th February 1955.*

I beg to submit herewith a report on the above operation conducted by the members of the Mines Rescue Brigade.

At 4-25 P.M. on the 5th February 1955 a call was received on telephone from Amlabad colliery requisitioning the services of the Permanent Brigade. Sri N. Chatterjee, Assistant Manager, Amlabad colliery while giving the call on phone stated that a very large roof fall have taken place in 18 seam workings of Amlabad colliery and quite a number of persons have been entrapped as a result of this fall. On being interrogated by me over the phone Mr. Chatterjee stated that there was every likelihood of accumulation of gas in the place where men are entrapped. The Permanent Brigade immediately turned out and arrived at the river bank at 4-25 P.M. and at the colliery by 5-15 P.M. On our way to Amlabad we sent a messenger to Bhowra colliery to collect all the rescue trained persons from there and bring them to Amlabad as quickly as possible. By 5-20 P.M., two trained persons arrived from Bhowra and immediately two teams were formed and one was sent underground by 5-30 P.M., in order to advance the ventilation to the place where men were supposed to be entrapped. Quite a number of respiratory apparatus were sent with this team with a view to apply them to the affected entrapped men and bring them to the Fresh Air. By 6 P.M. the Chief Inspector of Mines in India along with the Deputy Chief Inspector of Mines arrived at the colliery who were soon followed by other Senior Inspectorates of the Department

of Mines. After a hurried consultation with the Chief Inspector of Mines, the Deputy Chief Inspector of Mines went underground. After his first inspection of the affected area, the Deputy Chief Inspector of Mines declared that it was the case of an explosion and he personally took charge of the Rescue and Recovery operation in consultation with the Chief Inspector of Mines.

After consultation with the manager and the Assistant Manager of the mine, rescue teams were sent in all possible places where men could be found and also the places where they could take shelter, with a view to rescue them. Six rescue teams were mobilised for this purpose and a thorough search was made, in all the accessible places in the area but nowhere a living person could be traced. At about 2-30 A.M. on the 6th February 1955 all the persons including the members of the Rescue teams were withdrawn from the mine under the instruction of the Deputy Chief Inspector of Mines, as the conditions inside the affected area seemed to behave rather abnormally. This decision was taken only when it was very clearly ascertained by the Rescue teams after their thorough and extensive search in the affected area, that there was no possibility of any one being alive in the district. Up to this time about 40 bodies could be accounted for. According to the figure in the Attendance Book as reported by the Manager, the total number of lives involved in this accident was 55 which on subsequent checking was found to be 53 and out of these, two were already removed to the hospital.

At 9 A.M. on the 6th February five rescue teams were again mobilised on the surface and the first rescue team was sent down the pit by 10 A.M. First two teams were utilised for improving the ventilation in the main south district by erecting brattice stoppings in roadways through which air was found to be leaking. The rest of the teams were engaged in exploration work for searching for dead bodies in the rise district and to inspect the stoppings between the main return and the companion intake of the dip districts. One team was engaged to bring out six dead bodies from the rise district, which were located on the previous day. The work was postponed for the night and the permanent Brigade arrived back at the station after midnight in order to get fresh supply of charges for the apparatus from the station.

The Permanent Brigade arrived back at Amlabad colliery again at 8-15 A.M. on the 7th February with fresh charges of Protosorb and oxygen. 14 teams were formed on this day which continuously worked upto 5-30 A.M. on 8th February 1955. Five teams were employed for searching minutely for dead bodies in all the accessible places in the affected district. 9 dead bodies were found floating on water in the companion dip below 7th level in the dip district at 6-40 P.M. The rest of the teams were employed in bringing out the dead bodies from the water logged area in the companion dip to the main south level.

As some more dead bodies were to be accounted for, a call was given on the morning of 8th February 1955 by the Deputy Chief Inspector of Mines to the Superintendent, Mines Rescue Station, Sitarampur at the instance of the Chief Inspector of Mines to attend Amlabad with all his Permanent Brigade Members along with four rescue teams from collieries. Accordingly the Superintendent, Mines Rescue Station, Sitarampur attended the call on 8th February 1955 with his Permanent Brigade Members together with 18 colliery rescue trained persons from RaneeGUNJ coalfield.

Ten rescue teams were utilised on 8th February 1955 and almost all the teams were employed in the search for missing bodies in the dip districts off the main south level.

All the Permanent Brigade Members of Mines Rescue Station, Sitarampur along with the Rescue trained persons of RaneeGUNJ coalfield left Amlabad colliery by the night of the 9th February 1955 for their own station except Sri P. K. Banerjee, Senior Instructor who was required to stay at Amlabad colliery upto the morning of the 12th February 1955.

Seven rescue teams were engaged on 9th February, 1955, in screening all the approachable workings including the old stowed working in search of dead but to no purpose.

From 10th February 1955 to 12th February 1955 eight rescue teams were required to remain as standby when the works of building permanent ventilation stoppings were being done in the main south level district by ordinary workers under the guidance of the Chief Inspector of Mines and the Deputy Chief Inspector of Mines and other officers from the Department of Mines. One dead body was subsequently found in the main south level near the endless haulage

engine covered with debris which was removed by one of our Permanent Brigade members on the 10th February, 1955.

At 1 P.M. on 12th February 1955 on the orders of the Chief Inspector of Mines and the Deputy Chief Inspector of Mines the rescue teams together with all the equipments were withdrawn from the colliery. The Permanent Brigade arrived back at the station at 4 P.M.

In all 47 Rescue teams were mobilised for this operation. Besides these 47 teams quite a number of Rescue trained workers were also kept as reserve on the surface in order to meet any eventuality.

The work was carried out by 29 Rescue teams of Jharia field and one team from Ranigunj field in 176 Proto manshifts while 17 Rescue teams containing 90 Protomen remained as standby during the operation. In addition to this the services of 31 Protomen were also at our disposal on the surface. The organisation of Rescue teams in this operation was made with only 118 Protomen including the members of the Permanent Brigades.

A statement showing the number of rescue workers from Jharia and Ranigunj coalfields, who participated in this operation is given below:—

No. of Protomen participated.	No. of Protomen actually worked th apparatus.	No. of Protomen remained only as standby u/g and were not required to use apparatus.	No. of Protomen kept reserved on the surface and were not required to go underground.
field 80 from mines 8 P. Brigade	75 from mines 8 P. Brigade	from mines	1 from mines.
Ranigunj field. 18 from mines 12 P. Brigade	6 from mines 2 P. Brigade	Nil Nil	12 From mines 10 P. Brigade

**Remarks.**—It is gratifying to record here that all the members of our Rescue Stations along with the colliery rescue trained persons worked admirably and all the companies wherefrom the trained men were requisitioned co-operated very willingly and spared their men ungrudgingly.

The rota of rescue teams engaged in Amlabad operation showing the details of work done by each team along with the plans as referred to therein, is enclosed.

Yours faithfully,  
(Sd.) Superintendent.

Enc. Team Rota.  
15 plans.\*

#### ROTA OF RESCUE TEAMS

5th February 1955.

1st Team :	In—5-35 P.M.	Out—7-45 P.M. (In three Spells).
1. N. P. Singh Capt.	.	Bhowra Colliery.
2. Mahabir Prasad	.	Permanent Brigade.
3. K. N. Singh	.	Bhowra colly.
4. Lochan Barhi	.	Permanent Brigade.
5. S. B. Ashtikar	.	Do.

Work done	Inspected the main south level. Air crossings Nos. 1 and 2 were very badly damaged. Coal tubs were found scattered along the dip side all over the level off from the track. Electric switch-gears were thrown off from their seatings. Located (1st spell) 13 dead bodies with signs of burn. All the bodies were cold and no pulse could be felt. Details were marked on the Plan No. 1. *
(1st spell)	
(2nd spell)	Inspected the rise district and located six dead bodies with marks of the position of which severe burns, are shown in Plan No. 1. No living person could be traced in the district.
(3rd spell)	Inspected the dip district to close a ventilation door near 15 H.P. pump in order to improve ventilation. Located 21 dead bodies near the 60 H.P. haulage brow and the main haulage dip the position of which are marked on the plan No. 1.

\*Not printed.



The dead bodies found on the main haulage dip were found in normal condition without any signs of burns or any other injury. The details of the findings are marked on the Plan No. 1.\*

2nd Team : In—8-20 P.M. Out—9-40 P.M. (In two spells)

- |                     |   |   |   |   |                    |
|---------------------|---|---|---|---|--------------------|
| 1. K. R. Dass—Capt. | . | . | . | . | Bhowra Colliery.   |
| 2. J. K. Singh      | . | . | . | . | Permanent Brigade. |
| 3. S. K. Ghosh      | . | . | . | . | Do.                |
| 4. G. K. Bansikar   | . | . | . | . | Bhowra colliery.   |
| 5. G. Khan          | . | . | . | . | Permanent Brigade. |

Work done :

(1st spell) Inspected the area in the rise district making entry behind the endless haulage upto air crossing No. 1 which was found to be damaged.

(2nd spell) Inspected the area between the main intake of the dip district and the companion dip. Stoppings Nos. 1 and 3 were found to be in order and stoppings Nos. 2, 4\*, 5, 6 and 7 were found to be damaged. The details are shown in Plan No. 2.

3rd Team : In—10-15 P.M. Out—11-20 P.M.

- |                     |   |   |   |   |                    |
|---------------------|---|---|---|---|--------------------|
| 1. A. B. Shah—Capt. | . | . | . | . | Kankanee colliery. |
| 2. R. Dhobi         | . | . | . | . | Do.                |
| 3. K. Bhar          | . | . | . | . | Do.                |
| 4. Bishu Shaw       | . | . | . | . | Bhowra colliery.   |
| 5. D. No. Sarkar    | . | . | . | . | Kankanee colliery. |

Work done :

Inspected the dip district. Door in No. 4th level found to be damaged. No person could be found. Details are shown in Plan No. 3.\*

4th Team : In—11-30 P.M. Out—12-30 P.M.

- |                          |   |   |   |   |                    |
|--------------------------|---|---|---|---|--------------------|
| 1. G. J. Banerjee,—Capt. | . | . | . | . | Jamadoba colliery. |
| 2. S. N. Sinha           | . | . | . | . | Do.                |
| 3. G. B. Sarkar          | . | . | . | . | Do.                |
| 4. Manik Roy             | . | . | . | . | Pootkee colliery.  |
| 5. Ranghoo Singh         | . | . | . | . | Jamadoba colliery  |
| 6. S. P. Chatterjee      | . | . | . | . | Do.                |

Work done :

(Inspected the rise district making the entry from behind the 60 H. P. direct haulage. Observed six dead bodies. Coal dusts were seemed to be charged on the dead end of the gallery just ahead of the place where dead bodies were found. Air crossing No. 1 was found to be damaged. Details are marked on Plan No. 4\*.

5th Team :

- |                     |   |   |   |   |                        |
|---------------------|---|---|---|---|------------------------|
| 1. C. R. Bose—Capt. | . | . | . | . | Digwadih colliery.     |
| 2. Gondu Singh      | . | . | . | . | Jamadoba 6 and 7 Pits. |
| 3. S. B. Tewary     | . | . | . | . | Digwadih colliery.     |
| 4. M. L. Sharma     | . | . | . | . | Do.                    |
| 5. A. R. Khan       | . | . | . | . | Jamadoba colliery.     |

The team remained as standby at the Fresh Air Base under ground.

Reserve kept on the surface :

The following rescue trained persons comprising two teams were kept on the surface.

- |                        |   |   |   |   |                  |
|------------------------|---|---|---|---|------------------|
| 1. N. N. Chowdhury     | . | . | . | . | Bararee colliery |
| 2. H. C. Roy Chowdhury | . | . | . | . | Do.              |
| 3. P. C. Bose          | . | . | . | . | Do.              |
| 4. Ambica Chamar       | . | . | . | . | Do.              |
| 5. A. B. Dutta         | . | . | . | . | New Tetturya.    |
| 6. Jiban Das           | . | . | . | . | Jeetpur colliery |
| 7. Anmanta             | . | . | . | . | Do.              |
| 8. N. C. Sarkar        | . | . | . | . | Do.              |
| 9. J. N. Pandey        | . | . | . | . | New Tetturya.    |
| 10. Nanku Gope         | . | . | . | . | P. Brigade       |

The Captains of all the teams were examined by the Chief Inspector of Mines to ascertain the details about the affected area.

6th February, 1955

1st Team :

In—10 A.M.

Out—1-40 P.M.

1.	D. N. Sarkar—Capt.	.	.	.	Kankanee colliery.
2.	K. Bhar	.	.	.	Do.
3.	R. Dhobi	.	.	.	Do.
4.	Nanku Gope	.	.	.	Permanent Brigade.
5.	J. N. Pandey	.	.	.	New Teturya
6.	G. C. Mukerjee	.	.	.	Permanent Brigade.

Work done:

Went down the shaft of 18 seam with apparatus on in order to inspect the atmospheric condition near about the pit bottom, which was subsequently found to be clear and the apparatus was uncoupled and a signal was given on the surface to allow the inspectorates and other officials to come down. Accompanied the Deputy Chief Inspector of Mines in his inspection of the main return and other ventilation routes of the main south level districts. Established the Fresh Air Base at the main south level. Gas was detected on flame safety lamps near the main haulage brow. Apparatus was not required to be used.

2nd Team :

In—10 A.M.

Out—3-15 P.M.

1.	N. N. Chowdhury—Capt.	.	.	.	Bararee co
2.	H. C. Roy Chowdhury	.	.	.	Do.
3.	P. C. Bose	.	.	.	Do.
4.	Ambica Chamar	.	.	.	Do.
5.	Lochan Barhi	.	.	.	Permanent Brigade.

Remained standby for the 1st and 3rd team at the Fresh Air Base.

3rd Team :

In—1-40 P.M.

Out—3-10

(In two spells)

1.	G. J. Banerjee—Capt.	.	.	.	Jamadoba colliery.
2.	Ranghoo Singh	.	.	.	Do.
3.	Monsa Kora	.	.	.	Do.
4.	Bankim Chakravarty	.	.	.	Do.
5.	S. K. Ghosh	.	.	.	Permanent Brigade.

Work done:

(1st spell) Inspected the rise district upto air crossing No. 1. Atmosphere was found to be slightly heavy.

(2nd spell) Inspected the stoppings between the main return and the companion dip of the dip districts. Found the stoppings Nos. 1 and 3 not damaged and stoppings Nos. 2, 4, 5 and 6 were damaged. The stopping in the companion dip below No. 6 stopping was found to be broken. The double doors on the 7th level off the companion dip were found damaged. Details are shown in Plan No. 5.\*

4th Team :

In—6-30 P.M.

Out—7-20 P.M.

1.	S. B. Ashtikar—Capt.	.	.	.	Permanent Brigade.
2.	S. B. Tewary	.	.	.	Digwadih Colliery.
3.	J. K. Singh	.	.	.	Permanent Brigade
4.	M. L. Sharma	.	.	.	Digwadih colliery.
5.	C. R. Bose	.	.	.	Do.

Work done:

Entered the rise district from behind the 60 H.P. haulage. Six dead bodies were removed on stretcher to the main south level from behind the endless haulage.

Out of the six dead bodies the first two were lying at A facing each other with their mouths open and head towards the rise side. A good amount of coal dust was found deposited on their body. Out of the remaining four bodies lying

\*Not printed.

at B, three were lying with their hands covering their faces and head towards the rise side. One body was found lying above these three bodies with face downwards and hands and legs spread out as if jumped from a height towards the three bodies. One pick and two shools were found near the head of these four bodies.

Please refer to Plan No. 6.\*

*5th Team :*

1.	K.R. Das, Capt.	.	.	.	.	Bhowra colliery.
2.	M. Prasad	.	.	.	.	Permanent Brigade.
3.	Gendu Singh	.	.	.	.	Jamadoba 6 and 7 pits.
4.	G. K. Bansikar	.	.	.	.	Bhowra colliery.
5.	A. R. Khan	.	.	.	.	Jamadoba 6 and 7th pits.

This team remained as standby for the 4th team. The following members of the Rescue Brigade were kept ready on the surface as reserve:—

1.	N. P. Singh	.	.	.	.	Bhowra colliery.
2.	K. N. Singh	.	.	.	.	Do.
3.	Bishu Shaw	.	.	.	.	Do.
4.	Rashid Khan	.	.	.	.	Jamadoba.
5.	S. N. Dausandi	.	.	.	.	Digwadih
6.	H. S. Khosla	.	.	.	.	New Tetturya.
7.	A. B. Dutta	.	.	.	.	Do.
8.	Munshi Mistry	.	.	.	.	Jamadoba.
9.	Manik Roy	.	.	.	.	Pootkee.
10.	A. N. Sarkar	.	.	.	.	Jazmadoba.

Between 4 P.M. and 4-30 P.M. the rise district was inspected by Messrs. A. C. Bose and G. C. Mukherjee with Salvus apparatus.

*7th February 1955.*

*1st Team :*

In—11-0 A.M.

Out—12 Noon.

1.	A. B. Shah, Capt.	.	.	.	.	Kankanee colliery.
2.	K. N. Singh	.	.	.	.	Bhowrah colliery
3.	Bishu Shaw	.	.	.	.	Do.
4.	S. K. Ghosh	.	.	.	.	Permanent Brigade
5.	G.K. Bansikar	.	.	.	.	Bhowrah colliery
6.	N. P. Singh	.	.	.	.	Do.

*Work done:*

Inspected the dip district in search of bodies but found none. Thoroughly searched the 3rd, 4th and 5th level. Ventilation was found to be normal. Refer plan No. 7\*.

*2nd Team :*

In—12-30 P.M.

Out—1-40 P.M.

1.	K. R. Das—Capt.	.	.	.	.	Bhowrah colliery
2.	A. B. Datta	.	.	.	.	New Tetturya colliery
3.	A. N. Sarkar	.	.	.	.	Jamadoba colliery
4.	J. K. Singh	.	.	.	.	Permanent Brigade
5.	Manik Roy	.	.	.	.	Pootkee colliery
6.	H. S. Khosla	.	.	.	.	New Tetturya colliery

*Work done:*

Inspected the new district following the route marked on the Plan No. 7 in search of bodies but found none.

*3rd Team :*

In—2-15 P.M.

Out—3-15 P.M.

1.	D. N. Sarkar—Capt	.	.	.	.	Kankanee colliery
2.	K. Bhar	.	.	.	.	Do.
3.	R. Dhobi	.	.	.	.	Do.
4.	M. Prasad	.	.	.	.	Permanent Brigade
5.	A. R. Khan	.	.	.	.	Jamadoba 6 and 7 Pits.

\* Not printed.

*Work done:*

Inspected the main intake of the new district making the entry through the 7th level off the main haulage road of the dip district. Inspected the main return of the dip district. Nobody was traced. Below the fan explosive boxes, stemming rod and shot firing cable was located. Refer Plan No. 8\*.

*4th Team :*

In—3-50 P.M.

Out—5-10 P.M.

- |                         |   |   |   |   |                    |
|-------------------------|---|---|---|---|--------------------|
| 1. G. J. Banerjee—Capt. | . | . | . | . | Jamodoba colliery  |
| 2. Munshi Mistry        | . | . | . | . | Do.                |
| 3. Monsa Konra          | . | . | . | . | Do.                |
| 4. A. R. Khan           | . | . | . | . | Do.                |
| 5. G. C. Mukerjee       | . | . | . | . | Permanent Brigade. |

*Work done:*

The whole return airway from air crossing No. 2 down to No. 2 pit was explored. Both the air crossings Nos. 1 and 2 were found damaged. No dead body was traced. Refer to Plan No. 8\*.

*5th Team :*

In—5-50 P.M.

Out—6-40 P.M.

- |                    |   |   |   |   |                       |
|--------------------|---|---|---|---|-----------------------|
| 1. C. R. Bose—Capt | . | . | . | . | Digwadiah colliery    |
| 2. S B Tewary      | . | . | . | . | Do.                   |
| 3. Lochan Barhi    | . | . | . | . | Permanent Brigade     |
| 4. B. Chakravarty  | . | . | . | . | Jamodoba colliery     |
| 5. J. N. Pandey    | . | . | . | . | New Tetturya colliery |

*Work done:*

Proceeding along the main haulage dip inspected the 15 H.P. pump seating upto the sump. Entered 7th level and inspected the comp. dip. About 200 ft. below 7th level 9 bodies were found floating in water accumulated in the comp. dip. A shirt and a mining stick was found placed against the side in an orderly manner. Refer Plan No. 9\*.

*6th Team :*

In—7-55 P.M.

Out—8-55 P.M.

- |                        |   |   |   |   |                   |
|------------------------|---|---|---|---|-------------------|
| 1. S. B. Ashtikar—Capt | . | . | . | . | Permanent Brigade |
| 2. Ranghoo Singh       | . | . | . | . | Jamodoba colliery |
| 3. Ambica chamar       | . | . | . | . | Bararee colliery  |
| 4. Nanku Gope          | . | . | . | . | Permanent Brigade |
| 5. Gulab Khan          | . | . | . | . | Do.               |

*Work done:*

Went down to recover the dead bodies located by the previous team. Removed five dead bodies to a distance of 30 ft. from water edge. Bird and safety lamp were taken up to the water edge. There was no trace of gas any where on the route except at the water-edge where traces of gas was detected by the lamp which would be about 1 per cent.

*7th Team*

In—9-15 P.M.

Out—10-20 P.M.

- |                          |   |   |   |   |                   |
|--------------------------|---|---|---|---|-------------------|
| 1. M. N. Chaudhury—Capt. | . | . | . | . | Bararee colliery  |
| 2. H. C. Roy Choudhury   | . | . | . | . | Do.               |
| 3. P. C. Bose            | . | . | . | . | Do.               |
| 4. S. P. Chatterjee      | . | . | . | . | Jamodoba colliery |
| 5. Kamal Mia             | . | . | . | . | Bararee colliery  |
| 6. S. K. Ghosh           | . | . | . | . | Permanent Brigade |

*Work done:*

Recovered the dead bodies from the water logged area in the companion dip. Removed three floating dead bodies from water upto the 7th level.

*8th Team :*

In—10-30 P.M.

Out—11-45 P.M.

- |                     |   |   |   |   |                       |
|---------------------|---|---|---|---|-----------------------|
| 1. N. P. Singh—Capt | . | . | . | . | Bhowra colliery       |
| 2. K. N. Singh      | . | . | . | . | Do.                   |
| 3. Bishu Shaw       | . | . | . | . | Do.                   |
| 4. H. S. Khosla     | . | . | . | . | New Tetturya colliery |
| 5. A. R. Khan       | . | . | . | . | Jamodoba 6 and 7 pits |

\* Not printed.

*Work done:*

Inspected the water logged area in the companion dip approaching it from the dip side as shown in Plan No. 10. Found no body on that side. While returning, brought one dead body from the 7th level to the main south level haulage brow.

*9th Team :*

In—12-5 P.A.M.

Out—1-5 A.M. on 8-2-55.

- |    |                 |   |   |   |   |                       |
|----|-----------------|---|---|---|---|-----------------------|
| 1. | K. R. Das—Capt. | . | . | . | . | Bhowra colliery       |
| 2. | A. B. Dutta     | . | . | . | . | New Tetturya colliery |
| 3. | A. N. Sarkar    | . | . | . | . | Jamadoba colliery     |
| 4. | J. K. Singh     | . | . | . | . | P. Brigade            |
| 5. | Manik Roy       | . | . | . | . | Pootkee colliery      |
| 6. | B. B. Bid       | . | . | . | . | Digwadih colliery     |

*Work done:*

Brought 3 dead bodies from water edge to the 7th level and carried one body from the 7th level to main south level.

*10th Team :*

In—1-15 A.M.

Out—2 A.M.

- |    |                    |   |   |   |   |                   |
|----|--------------------|---|---|---|---|-------------------|
| 1. | D. N. Sarkar—Capt. | . | . | . | . | Kankanee Colliery |
| 2. | K. Bhar            | . | . | . | . | Do.               |
| 3. | R. Dhobi           | . | . | . | . | Do.               |
| 4. | M. Prosad          | . | . | . | . | Permanent Brigade |
| 5. | G. K. Bansikar     | . | . | . | . | Bhowra colliery   |

*Work done:*

Brought two dead bodies from the 7th level to the main south level.

*11th Team :*

In—2-30 A.M.

Out—4 A.M.

- |    |                       |   |   |   |   |                   |
|----|-----------------------|---|---|---|---|-------------------|
| 1. | G. J. Banerjee —Capt. | . | . | . | . | Jamadoba colliery |
| 2. | Mushi Mistry          | . | . | . | . | Do.               |
| 3. | Monsa Kora            | . | . | . | . | Do.               |
| 4. | A. R. Khan            | . | . | . | . | Do.               |
| 5. | Nanku Gope            | . | . | . | . | Permanent Brigade |

*Work done:*

Carried three bodies from the water edge to the 7th level and one body from the 7th level to main south level.

*12th Team :*

In—4-20 A.M.

Out—5-15 A.M.

- |    |                     |   |   |   |   |                       |
|----|---------------------|---|---|---|---|-----------------------|
| 1. | C. R. B. Bose Capt. | . | . | . | . | Digwadih colliery     |
| 2. | S. B. Tewary        | . | . | . | . | Do.                   |
| 3. | Lochan Barhi        | . | . | . | . | Permanent Brigade     |
| 4. | B. Chakravarty      | . | . | . | . | Jamadoba colliery     |
| 5. | J. N. Pandey        | . | . | . | . | New Tetturya colliery |

*Work done:*

Brought two dead bodies from 7th level to main south level.

*13th Team :*

In—5-20 A.M.

Out—6 A.M.

- |    |                       |   |   |   |   |                  |
|----|-----------------------|---|---|---|---|------------------|
| 1. | N. N. Chowdhury—Capt. | . | . | . | . | Bararee colliery |
| 2. | H. C. Roy Chowdhury   | . | . | . | . | Do.              |
| 3. | P. C. Bose            | . | . | . | . | Do.              |
| 4. | Ambica Chamar         | . | . | . | . | Do.              |
| 5. | Kamal Mian            | . | . | . | . | Do.              |

*Work done:*

Searched for further dead bodies in water but found none. Brought the last two dead bodies from 7th level to the main south level.

*14th Team :*

- |    |                      |   |   |   |   |                   |
|----|----------------------|---|---|---|---|-------------------|
| 1. | S. B. Ashtikar—Capt. | . | . | . | . | Permanent Brigade |
| 2. | S. P. Chatterjee     | . | . | . | . | Jamadoba colliery |
| 3. | A. B. Shah           | . | . | . | . | Kankanee colliery |
| 4. | G. Khan              | . | . | . | . | Permanent Brigade |
| 5. | G. C. Mukherjee      | . | . | . | . | Permanent Brigade |

Remained as standby underground for the 13th team.

8th February 1955.

1st Team :	In—10-35 A.M.	Out—12-0 Noon
1. R. N. Pandey—Capt. . . . .		Lodna colliery
2. Lachhman Singh . . . . .		Do.
3. Seo Charan Pasi . . . . .		Do.
4. S. N. Sen . . . . .		Do.
5. D. N. Chakaravarty . . . . .		Do.
6. Mahabir Belder . . . . .		Do.

Work done:

Searched the dip districts for body of the victims but could not trace any. Refer Plan No. 11.\*

2nd Team :	In—12-15 P.M.	Out—1-10 P.M.
1. M. S. Krishnan—Capt. . . . .		Burragarh colliery.
2. A. B. Moitra . . . . .		Kustore colliery.
3. Sirajuddin . . . . .		Burragarh colliery.
4. Hansraj Missir . . . . .		Kustore colliery.
5. G. A. Platts . . . . .		Do.
6. H. S. Ahuja . . . . .		Do.

Work done:

Searched the water logged area in the companion dip approaching it from the dip side for dead bodies. Suspected some floating object as human body and reported accordingly to the next team. Refer Plan No. 11.\*

3rd Team :	In—2-10 P.M.	Out—3-40 P.M.
1. D. D. Ganguly—Capt. . . . .		Jeetpur colliery
2. N. C. Sarkar . . . . .		Do.
3. Lachman Dusad . . . . .		Bhulanbararee colliery
4. P. N. Mukherjee . . . . .		Do.
5. P. K. Banerjee . . . . .		P. Brigade (S.R.D.S.)

Work done:

As reported by the previous team this team searched for dead body in the waterlogged area in the companion dip, approaching it from the dip side but could not trace any. Refer Plan No. 11\*.

4th Team :	In—4 P.M.	Out—5-30 P.M.
1. P. Banerjee—Capt. . . . .		Chanch colliery (Ranigunj field)
2. Bindeswarl Prasad . . . . .		Do.
3. S. K. Bose . . . . .		Laikdih colliery
4. Indu Hazara . . . . .		Chanch colliery
5. N. G. Mitra . . . . .		Do.
6. C. C. Ghosh . . . . .		New Laikdih colliery

Work done:

Made further search for dead bodies in the waterlogged area by sending one member inside water for a distance of 40' but could not find any. Refer Plan Nos. 11 and 12\*.

5th Team :	In—5-30 P.M.	Out—7 P.M.
1. K. L. Sethi—Capt. . . . .		Tata's Sijua colliery
2. D. N. Mukherjee . . . . .		Bhelatand colliery
3. Lachmi Singh . . . . .		Tata's Sijua colliery
4. C. R. Chatterjee . . . . .		Do.
5. B. R. Sukul . . . . .		Do.
6. A. K. Chatterjee . . . . .		Do.

\* Not printed.

*Work done:*

Went to the water logged area in the companion dip and made a search for the dead bodies which might have sunk by throwing tackle at different places in the submerged area, but found nothing. Search was also made with rollas but to no purpose. Refer Plan\* No. 12.

*6th Team :*

In—7 P.M.

Out—7-30 P.M.

- |                      |                       |
|----------------------|-----------------------|
| 1. N. N. Kapur—Capt. | Tata's Sijua colliery |
| 2. S. K. Mukherjee   | Do.                   |
| 3. G. G. Biswas      | Do.                   |
| 4. J. P. Lall        | Do.                   |
| 5. A. K. Sinha       | Jamadoba 6 and 7 Pits |
| 6. R. N. Roy.        | Tata's Sijua colliery |

This team was sent in search of dead bodies but could not do any useful work as one member Sri J. P. Lall gave distress signal and the whole team had to come back to Fresh Air Base. He complained about his breathing difficulty, the cause of which was attributed to the defective apparatus. The apparatus worn by him was examined by the Superintendent, Mines Rescue Station, Sitarampur (as it was the apparatus of that Station) and found to be quite in order.

*7th Team :*

In—P.M.

Out—9-25 P.M.

- |                    |                          |
|--------------------|--------------------------|
| 1. P. K. Dey—Capt. | Bhulanbararee colliery   |
| 2. Amrica Singh    | Sendra Bansjora colliery |
| 3. Madho Singh     | Bhulanbararee colliery   |
| 4. A. K. Sen Gupta | East K Ekra colliery     |
| 5. Harihar Datta   | Sendra Bansjora colliery |
| 6. Baba Singh      | Bhulanbararee colliery   |

*Work done:*

The team inspected minutely the water logged area approaching from the dip side in search of dead bodies but could not find any. The team also inspected 15 H.P. Pump lodgement in search for dead bodies but found none. Refer Plan No. 13\*.

*8th Team :*

From 5 P.M. to 9-25 P.M.

- |                       |                          |
|-----------------------|--------------------------|
| 1. S. R. Raikar—Capt. | Khas Jharla colliery     |
| 2. N. N. Roy.         | Do.                      |
| 3. B. N. Mitra        | East Bhuggatdih colliery |
| 4. R. N. Sarkar       | East Ena colliery        |
| 5. G. S. Mukherjee    | Madhuband colliery       |

Remained as standby underground. The following members of the Rescue Brigade were kept reserved on the surface:—

- |                    |   |
|--------------------|---|
| 1. D. Chakravarty  | Loyabad colliery                          |
| 2. D. P. Ghosh     | Do.                                       |
| 3. Jeorakhan Gope. | Do.                                       |
| 4. Bowa Singh      | Do.                                       |
| 5. Bulaki Gope     | Do.                                       |
| 6. N. K. Roy       | Banksimulia 7 and 8 pits (Ranigunj field) |
| 7. M. S. Mukherjee | Dhemomain colliery                        |
| 8. P. Kabi         | Banksimulia 7 and 8 pits                  |
| 9. D. N. Paul      | Korabad colliery                          |
| 10. Lakhan Mahato  | Junkundar colliery                        |
| 11. C. Roy         | Churulla colliery                         |

9th February 1955.

*1st Team :*

In—11-20 A.M.

Out—12-40 P.M.

- |                         |                  |
|-------------------------|------------------|
| 1. D. Chakravarty—Capt. | Loyabad colliery |
| 2. Bowa Singh           | Do.              |
| 3. J. N. Pandey         | New Totturya     |
| 4. D. P. Ghosh          | Loyabad colliery |
| 5. Bulaki Gope          | Do.              |

\* Not printed.

*Work done:*

Inspected in search for victims in all accessible places including the stowed area of the east side of the main haulage. Returned to Fresh Air Base *via* air crossing No. 2 which was found to be damaged. Nobody could be traced. Refer Plan No. 14\*.

*2nd Team :*

In—1 P.M.

Out—2-15 P.M.

1.	G. S. Mukherjee—Capt.	.	.	.	.	Madhuband colliery
2.	Baba Singh	.	.	.	.	Bhulanbararee colliery
3.	R. N. Sarkar	.	.	.	.	East Ena colliery
4.	Jamuna Singh	.	.	.	.	P. Brigade (Sitarampur Rescue station)
5.	B. N. Mitra	.	.	.	.	East Bhuggatdih colliery
6.	Madho Singh	.	.	.	.	Bhulanbararee colliery

*Work done:*

Made a further search for dead bodies in all the accessible places in the dip district. One coal cutter machine was seen in the last but one level.

*3rd Team :*

In—2-20 P.M.

Out—3-30 P.M.

1.	D. N. Sarkar—Capt.	.	.	.	.	Kankanee colliery
2.	R. Dhobi	.	.	.	.	Do.
3.	K. Bhar	.	.	.	.	Do.
4.	A. B. Dutta	.	.	.	.	New Tetturya colliery
5.	Joorakhan Gope.	.	.	.	.	Loyabad colliery.
6.	H. S. Khosla	.	.	.	.	New Tetturya

*Work done:*

Made an attempt to inspect the stowed area of the east side of the main haulage dip but entry to this area was found to be very difficult due to heavy roof fall which had already taken place.

Went to the water logged area in the companion dip and noted the numbers of the safety lamps. Please refer to Plan No. 15.\*

*4th Team :*

1.	G. J. Banerjee Capt.	.	.	.	.	Jamadoba colliery.
2.	Ranghoo Singh	.	.	.	.	Do.
3.	Munshi Mistry	.	.	.	.	Do.
4.	Bankim Chakravarty	.	.	.	.	Do.
5.	G. B. Sarkar	.	.	.	.	Do.
6.	A. R. Khan	.	.	.	.	Do.

The team remained as standby underground from 1 P.M. to 5-30 A.M.

*5th Team :*

1.	S. N. Sen —Capt.	.	.	.	.	Lodna colliery
2.	Lachman Singh	.	.	.	.	Do.
3.	Sew Charan Passi	.	.	.	.	Do.
4.	Ambica Chamar.	.	.	.	.	Bararee colliery.
5.	D. N. Chakravarty	.	.	.	.	Lodna colliery

The team remained standby underground between 3-30 P.M. and 10-30 P.M.

*6th Team :*

1.	D. N. Sarkar—Capt.	.	.	.	.	Kankanee colliery
2.	R.Dhobi	.	.	.	.	Do.
3.	K. Bhar	.	.	.	.	Do.
4.	A. B. Dutta	.	.	.	.	New Tetturva colliery
5.	Manik Roy	.	.	.	.	Pootkee colliery
6.	H. S. Khosla.	.	.	.	.	New Tetturva colliery

The team remained as standby between 10 P.M. and 6 A.M. on 10th February 1955 when ordinary workers were engaged in building ventilation stoppings.

\* Not printed.



*7th Team :*

- |    |                  |   |   |   |   |                        |
|----|------------------|---|---|---|---|------------------------|
| 1. | C. R. Bose—Capt. | . | . | . | . | Digwadih colliery.     |
| 2. | S. B. Tewari     | . | . | . | . | Do.                    |
| 3. | B. B. Bid        | . | . | . | . | Do.                    |
| 4. | M. L. Sharma     | . | . | . | . | Do.                    |
| 5. | Gendu Singh      | . | . | . | . | Jamodaba 6 and 7 Pits. |
| 6. | A. R. Khan       | . | . | . | . | Do.                    |

The team remained as standby on the surface.

*10th February 1955 :*

*1st Team :*

- |    |                          |   |   |   |   |                   |
|----|--------------------------|---|---|---|---|-------------------|
| 1. | S. K. Ghosh—Capt.        | . | . | . | . | Permanent Brigade |
| 2. | Gulab Khan               | . | . | . | . | Do.               |
| 3. | Lochan Barhi             | . | . | . | . | Do.               |
| 4. | Ma' . . . . . Sir Prasad | . | . | . | . | Do.               |
| 5. | J. K. Singh              | . | . | . | . | Do.               |

Remained as standby between 10 A.M. and 4 P.M. at the Fresh Air Base and removed one dead body from Main south level.

*2nd Team :*

- |    |                    |   |   |   |   |                    |
|----|--------------------|---|---|---|---|--------------------|
| 1. | D. N. Sarkar—Capt. | . | . | . | . | Kankanee colliery. |
| 2. | Bishu Shaw         | . | . | . | . | Bhowra colliery.   |
| 3. | G. K. Bansikar     | . | . | . | . | Do.                |
| 4. | K. . . . . Bhar    | . | . | . | . | Kankanee colliery. |
| 5. | K. N. Singh        | . | . | . | . | Bhowra colliery.   |

Remained as standby between 4 P.M. and 12 night when ordinary workers were employed underground.

*11th February 1955 :*

*1st Team :*

- |    |                        |   |   |   |   |                       |
|----|------------------------|---|---|---|---|-----------------------|
| 1. | S. P. Chatterjee—Capt. | . | . | . | . | Jamadoba colliery.    |
| 2. | A. R. Khan             | . | . | . | . | Jamadoba 6 and 7 Pits |
| 3. | Ranghoo Singh          | . | . | . | . | Jamadoba colliery.    |
| 4. | Munshi Mistry          | . | . | . | . | Do.                   |
| 5. | Monsa Kora             | . | . | . | . | Do.                   |
| 6. | B. Chakravarty         | . | . | . | . | Do.                   |

Remained as standby between 8 A.M. and 4 P.M. when ordinary workers were engaged in building stoppings

*2nd Team :*

- |    |                      |   |   |   |   |                     |
|----|----------------------|---|---|---|---|---------------------|
| 1. | M. S. Krishnan—Capt. | . | . | . | . | Burragarh colliery. |
| 2. | A. B. Moitra         | . | . | . | . | Kustore colliery.   |
| 3. | H. Missir            | . | . | . | . | Do.                 |
| 4. | Sirajuddin           | . | . | . | . | Burragarh colliery. |
| 5. | J. C. Dhar           | . | . | . | . | Kustore colliery.   |

Remained as standby between 4 P.M. and 8 P.M. when ordinary workers were engaged in building stoppings underground.

*3rd Team :*

- |    |                    |   |   |   |   |                        |
|----|--------------------|---|---|---|---|------------------------|
| 1. | H. S. Khosla—Capt. | . | . | . | . | New Tetturia colliery. |
| 2. | A. B. Datta        | . | . | . | . | Do.                    |
| 3. | R. Dhobi           | . | . | . | . | Kankanee colliery.     |
| 4. | G. S. Mukherjee    | . | . | . | . | Madhuband colliery.    |
| 5. | J. N. Pandey       | . | . | . | . | New Tetturya colliery. |

The team remained as standby on the surface.

12th February 1955

1st Team

- |    |                     |   |   |   |                        |
|----|---------------------|---|---|---|------------------------|
| 1. | D. N. Sarkar —Capt. | . | . | . | Kankanee colliery.     |
| 2. | R. Dhobi            | . | . | . | Do.                    |
| 3. | K. R. Dhar          | . | . | . | Do.                    |
| 4. | J. N. Pandey        | . | . | . | New Tetturya colliery. |
| 5. | G. S. Mukherjee     | . | . | . | Madhuband colliery.    |

2nd Team :

- |    |                   |   |   |   |                    |
|----|-------------------|---|---|---|--------------------|
| 1. | S. K. Ghosh—Capt. | . | . | . | Permanent Brigade. |
| 2. | K. R. Das         | . | . | . | Bhowra colliery.   |
| 3. | K. N. Singh       | . | . | . | Do.                |
| 4. | J. K. Singh       | . | . | . | Permanent Brigade. |
| 5. | Lochan Barhi      | . | . | . | Do.                |

3rd Team :

- |    |                      |   |   |   |                        |
|----|----------------------|---|---|---|------------------------|
| 1. | S. B. Ashtikar—Capt. | . | . | . | Permanent Brigade.     |
| 2. | Golab Khan           | . | . | . | Do.                    |
| 3. | M. Prosad            | . | . | . | Do.                    |
| 4. | Nanku Gope           | . | . | . | Do.                    |
| 5. | A. B. Dutta          | . | . | . | New Tetturya Colliery. |
| 6. | Bishu Shaw           | . | . | . | Bhowra colliery.       |

The above three teams were kept as standby underground between 9 A.M. and 12-30 P.M. when ordinary workers were engaged underground.

(Sd.)

Superintendent,  
Mines Rescue Station, Jharia.

#### APPENDIX V

INSPECTION NOTE SUBMITTED BY THE CHIEF INSPECTOR OF MINES IN RESPECT OF THE FIRST INSPECTION MADE BY THE COURT OF INQUIRY ON THE 4TH MARCH, 1955.

Name of Mine	:	Amlabad.
Name of owners	:	Bhowra Kankanee Collieries Ltd.
Date	:	4th March, 1955.

Accompanied by the Chief Inspector of Mines in India, Mr. Justice B. P. Jamuar, Chairman, Court of Inquiry, and Messrs. Shome and Das, the two assessors, reached the mine at about 10-40 A.M. and went underground to inspect the workings of South District in which explosion took place on the 5th February, 1955. Two representatives of labour also accompanied them.

The Party descended the mine by No. 1 shaft and followed the endless haulage road leading to the district. The Deputy Chief Inspector of Mines and Mr. Ramanathan, Assistant Chief Inspector of Mines, who had gone underground earlier, met the party near the 'Mochi' Line. The Chief Inspector of Mines pointed out to the Court of Inquiry the black dust deposited on the roof and sides of the stone drift after the explosion.

The party passed beneath the damaged air crossing which was supported on two loaded tubs and got into the Main South Level. The new stoppings built in the galleries on both sides of the haulage road were pointed out to the Court. The Chief Inspector of Mines also showed the Court the tubs and the switchgears, cables, etc., which had been lifted from their original positions and were lying against the dip side pillars.

The Chief Inspector of Mines also drew the attention of the Court to a piece of stowing pipe which having snapped from the pipe range was thrown some 6 to 7 ft. away and was lying against the above mentioned tubs on the dip side of the haulage track. The Chief Inspector of Mines explained to the Court that it was obvious from the above mentioned information that the force of explosion came from the rise galleries into the Main South Level and then travelled outbye along the endless haulage road.

The party proceeded inbye and inspected the 80 H.P. New main dip haulage and the endless haulage installed on the rise side of the haulage track. Attention of the Court was drawn by the Chief Inspector of Mines to the damaged parts of the haulage gear.

The party went up the Main dip haulage road and inspected the 60 H.P. haulage engine installed in a rise gallery. The Chief Inspector of Mines drew attention of the Court to the Controller, Resistance, Switchgear, Cables, etc., which had been lifted off their original positions by the force of explosion and were lying at different places. He also explained that there was a stopping behind the haulage engine with a small hole in it and that this stopping was also destroyed by the explosion. The Deputy Chief Inspector of Mines tested for gas behind the haulage engine and found  $2\frac{1}{2}\%$  gas near the roof some 10 feet from the haulage engine. The Chief Inspector of Mines explained to the Court that 'sparking' at an electric apparatus could cause an ignition of Firedamp or Inflammable gas which could result in an explosion. He made it clear however, that the possibility of explosion due to other causes was not ruled out as detailed investigation had not yet been made by the officers of the Department.

The party proceeded towards the dip side along the haulage road. The attention of the Court was drawn to the safety lamps, picks, baskets, shovels, etc., which were lying on the haulage road. The Chief Inspector of Mines explained that these articles belonged to the persons who worked in the dip district and had evidently travelled up the haulage road after the explosion. These persons were affected by Carbon Monoxide which is always present in the "afterdamp" (mine atmosphere immediately after an explosion).

The party went about 100 feet below the haulage brow and then returned.

On their way back, the Chief Inspector of Mines took the Court to the Rise side district by passing through a door provided in a newly built stopping behind the Endless haulage. The party went upto the junction of this rise gallery and the South side gallery which is about 30 feet from the stopping. They did not go further in due to the presence of gas about 15 feet inbye. The attention of the Court was drawn to the drilling machine with trailing cable attached to it and lying near the above mentioned junction.

The party came out of the district and then proceeded outbye to the Pit bottom. On the way back, the Chief Inspector of Mines drew the attention of the Court to the props and cogs on which black dust had been deposited. He also showed the place near the new dip haulage where a dead body of a timberman was found. He requested the Court to inspect the air crossing which had been badly damaged by the explosion and was resting on two tubs as already stated. The place from where Bande Ali Mian, the injured person now lying in the hospital, was picked up after the explosion was also pointed out to the Court.

The party returned by the same route by which they had gone inbye. They came upto the surface by No. 1 shaft.

On the surface they inspected the winding engine of No. 1 shaft, the fan room, the ballmill and the safety lamp room.

#### NOTE

I herewith forward the notes submitted by the two Assessors, Shri S. N. Das and Shri M. L. Shome.

Shri S. N. Das has expressed his general agreement with the conclusions reached and the recommendations made in the report.

Shri M. L. Shome has arrived, in some matters, at conclusions which are contrary to the report, and it is in this connection that I desire to append this note. The question is whether an assessor appointed under section 24 of the Indian Mines Act 1952, can come to conclusions contrary to the report. I think that a clarification is necessary for future guidance.

If, in the opinion of the Central Government, a formal inquiry into the causes of, and the circumstances attending, an accident ought to be held, it has been empowered by section 24(1) of the Mines Act to appoint "a competent person to hold such inquiry"; and it may also appoint "any person or persons possessing legal or special knowledge to act as assessor or assessors" in holding the inquiry.

Under sub-section (4) of section 24, the report is to be made to the Central Government by "the person holding an inquiry", that is to say, by the competent

person appointed under sub-section (1). And, to his report, the competent person may add "any observations which he, or any of the assessors, may think fit to make". It seems to me that the term "observations" is not synonymous with the term "report". The "report" states, as is provided under sub-section (4), "the causes of the accident and its circumstances", and this is the function of the competent person, and it does not appear to be the function of an assessor. In ordinary legal language, an assessor is appointed to assist the Judge. I would, therefore, conclude that, under the Mines Act also, an assessor is appointed to assist the competent person in arriving at his findings regarding the causes of, and the circumstances attending, an accident, and I do not think that an assessor is permitted to give findings contrary to the report of the competent person. Accordingly, an assessor, under the law, would not be at liberty to submit a different report which may run counter to the findings of the competent person. An assessor may, of course, add his observations, if any, regarding the matters noticed by him in the course of the inquiry, and he may also add his own suggestions and recommendations.

In forwarding the note prepared by Shri M. L. Shome, I add my own comments upon it.

1. I have found in my report that the rise section had not been worked till the time of the present Management, and, even during the time of the present Management, the working was not regular. Shri M. L. Shome has come to the conclusion that it would appear that this area was being regularly worked for some months prior to the accident, that is, even since the time of the previous Management. In paragraph 3, he has said: "In my opinion, there was, however, nothing wrong in re-opening this section." This is not enough. Even if regular working was going on in that area, this will not indicate that it was either safe or made safe from danger. I have indicated that, in order to work that area, proper ventilation was necessary, and it seems that it was because of the difficulty in ventilating that area that that area had not been worked so long. Shri M. L. Shome does not appear to have looked at the question from this point of view.

2. With regard to the adequacy of ventilation, Shri M. L. Shome has referred to the mining legislation of the various States in the U.S.A., and he has pointed out that 100 to 150 cubic feet per person in a non-gassy mine and 200 cubic feet per minute per person in a gassy mine are specified therein. Now, the quantity of air required to ventilate a mine has to be examined from different points of view. Comfort conditions of workmen in regard to temperature and humidity have to be borne in mind. Then the dilution of noxious and inflammable gases has also to be remembered. Then there are other factors which must not be lost sight of; such as the number of men working, the extent of working, the liability or otherwise to spontaneous combustion, the amount of explosives used, the volume of firedamp and other gases omitted from the strata. In regard to evolution of inflammable gases, no two mines can be compared, and general rules have only a bearing for large areas or coalfields when based on actual experience. The figures for U.S.A. are based on American coalfields, and they can have but a limited application even in the U.S.A. and cannot be taken as certain without actual observations in Indian mines. One other important matter to bear in mind, and which, I think, Shri M. L. Shome has not sufficiently appreciated, is that the U.S.A. figures are based upon a supply of fresh air and not air which has been vitiated after passing along goaf edges, etc.,. Air that has passed through abandoned sections, or that has been used to ventilate pillar lines, ought not to be re-used to ventilate live workings. The effect of the reduction of the quantity of air flowing into the rise level, when the air is short-circuited, will in no way improve the condition to the north-west of the endless haulage but will, I imagine, worsen it between the endless rise and the main sough rise (direct haulage).

3. I have come to the conclusion, in my report, that there was accumulation of gas in the rise area. I have not accepted the theory put forward on behalf of the Management that there was a sudden omission of gas from the stowed area by roof-fall inside the goaf. Shri M. L. Shome has accepted the theory put forward on behalf of the Management. I wish to say nothing more in this connection except that he has not dealt with the evidence on this matter, which discussion is to be found in my report. I only wish to say that, in paragraph 12(3) of his note, Shri M. L. Shome has mentioned that, during the Court's visit on the 4th March, 1955, underground, he had personally noticed a gap between the sand and the roof. But he did not bring that to my notice, and perhaps not to the notice of the other Assessor, Shri S. N. Das, either.

4. Shri M. L. Shome has supported his theory of a roof-fall inside the goaf by saying that the sand-towing was not being done properly. He has referred to some reports in connection with the inspections made of goaf areas. I considered it more important to examine whether the particular stowed area from

which gas was alleged to have come out as an on-rush, according to the Management, had been, or had not been, effectively packed. I do not think it safe to draw a conclusion from the condition of the other areas generally. Furthermore, it is likely that, when the quantity of sand stowed is not adequate enough to keep up with coal extraction, voids would be left inside the goaf, and falls may take place producing heavy booming sounds; but they are unlikely to release such volumes of gas instantaneously into the workings unless there is a single passage of sufficient size to concentrate all the pressure in one direction and foul the mine atmosphere. Even if a certain quantity of gas had been pushed out slowly, it will aggravate the conditions not towards the north-western side of the endless haulage but in the region between the endless haulage and the main sough dip. Before the percentage of gas can be 10 towards the north-west of the endless haulage, where the short-circuited air was diluting it, it must reach twice or three times this volume in the other part. Such a large quantity of gas could not be pushed out from the goaf even with the most imperfect conditions of packing. The quantity of gas as would fill up all the rise headings and the level galleries up to the endless haulage rise before it can produce 10 per cent. concentration even after dilution by the short-circuited split would be in the region of about one lac cubic feet in a fraction of a minute. Hence, I do not think that the theory put forward on behalf of the Management ought to be accepted.

5. Shri M. L. Shome has also expressed disagreement with regard to my comments on the question whether the 60 H.P. main dip haulage engine was liable to give out open sparking or not as also on the "scat of explosion". In these matters, I wish to add nothing to what I have already stated in my report.

(Sd.) B. P. JAMUAR,

Court of Inquiry.

The 26th September, 1955.

I am in general agreement with the conclusions reached and recommendations made in the report. But I would like to make the following observations for the consideration of the Government leading to implementation of some of the suggestions contained therein:

1. Code of Safety Regulations as framed under the Indian Mines Act, 1923, though modified from time to time up to 31st December 1951, are still in operation, although they had to be framed afresh by Government as provided in the Indian Mines Act, 1952. It is not known why so much time is being taken to frame such rules and regulations under the new Act. Having in view the changes that have taken place with regard to organisation, methods of work and equipment, it was all the more necessary that existing regulations should have been revised and brought up-to-date. It is hoped, now no time will be left to prepare new rules and regulations as will improve the safety of the working and ensure adequate safety and necessary safeguards for health and well-being of mine workers, who have to work in very difficult and dangerous circumstances.

2. Having regard to the importance of mining in national life of the country and dangerous and complex nature of their working involving the lives of thousands of people and requiring expert and scientific knowledge for carrying on the management and administration of this industry, I think, the time has now come when a Central Mines Council be appointed by the President in accordance with the provision of the Constitution with a view to advise the Governments, both Central and of States on all matters concerning mines either referred to it by the Governments or *suo-moto*.

3. In course of the inquiry, the Court had to consider some technical and scientific subjects involving results of experiments and researches. Parties concerned submitted facts which were the outcome of researches carried on in another country. Conditions of working of mines differ from country to country. Therefore researches carried on in other country may or may not apply here in all its bearings.

It is, therefore, necessary that experiments and researches with regard to subjects dealing with mining, both fundamental and applied be carried on in the country.

I, therefore, suggest that an Institute be established for scientific research into firedamp, coal-dust, mining explosives, ventilation etc., at an early date.

(Sd.) SHRI NARAYAN DAS, M.P.,

Assessor, Court of Inquiry.

I append my observations.

### RE: DERANGEMENT OF VENTILATION:

It has been contended by various parties that the derangement of ventilation due to the opening of the door was the cause of accumulation of gas on the fateful day of the 5th February, 1953, in the Rise Section of the Main South Level of No. 18 seam. That this Rise Section, which will also henceforward be stated as "affected area", was being worked and used for quite sometime after a lapse of say about 20 years, is evident from the recorded additional progress made in that Section by driving new galleries and also by taking down roof and sides of old galleries.

2. According to the present management it was being worked for 4 or 5 months, that is, from October, 1954, but according to the previous management, that is, Messrs. Macneill Barry & Co. Ltd., it was not worked till 31st December 1954, which was the last date of their management and after which the present management took charge of the colliery.

3. In my opinion, there was, however nothing wrong in reopening this Section. Taking that it was being worked from early January, 1955, one must admit that quite a good progress had been made. The magnitude of the progress indicates that the work was quite regular, as otherwise the galleries marked "L" on exhibit No. M-1\*, could not have been driven in about 24/25 working days. To achieve such a progress, irregular work would surely take several months which would in turn mean that the work was carried on even during the months of October, November and December, 1954. On scrutinising the plan Ext. M-1, one cannot but come to the conclusion that it worked daily and, probably for more than one shift on every working day.

4. According to the evidence of Sarajballi Missir (M.W. 4). 29 men were engaged in cutting coal between the affected section and the main dip section of the Sough District. According to the statement of dead bodies, there were 29 miners, 8 trammers, 3 timbermen, 2 munshies, 2 sirdars, 1 haulage Khalasi, 2 drillers, 1 dresser, 1 shot-firer, 1 shot-firer helper, 1 line mistry, and 1 T. repair. Of these, 13 miners, 3 timbermen, 1 munshi and 1 sirdar were presumably working in the affected area and within the ventilating current of the Rise Section. We may also add one shot-firer and his helper to be there although at the time of the explosion they were not there. The total number of persons, therefore, would be 20. The trammers and Haulage Engine Driver having had to work in the main south level, were not sharing the ventilation, that passed through the "affected area". About 6960 cft. of air which has been accepted by the Mines Department and the Labour Unions but not by the Management of the Colliery, were passing through the stowed-goaf edge and the working places of the affected Rise Section.

5. According to the Mining Legislation of various States in the U.S.A. 100 to 150 cft. per minute per person is a non-gassy mine and 200 cft. per man per minute in a gassy mine are specified. In India there is no mention of any specified quantity per person per minute. Indian law only stipulates "adequate ventilation" shall be constantly produced in every mine to clear away smoke. .... (Reg. 121). Evidently, the quantities of air required per man in a gassy mine, as stipulated in various States in the U.S.A., are meant to represent "adequate ventilation".

6. The "affected area" in the 18 seam of Amlabad Colliery, is a comparatively small section and had about 20 persons only working that day, the ventilation was not, therefore, inadequate on the basis of the U.S.A. standard. That the ventilation was good enough is also proved by the fact that no gas accumulation occurred on any of the previous days, though condition of work did not materially vary to any appreciable extent on these days. It can also be said that it was good even during the morning hours of the fateful day.

7. Quantity of air passing through the goaf edge and the depillaring section, between the period the auxiliary fan was removed and up to 31st December, 1954, was also presumably the same 6960 cft. per minute as conditions were the same.

8. Even accepting that 50 per cent. of the 6960 cft. of air was only available between the goaf edge and the Endless rise gallery, the other 50 per cent. would join this quantity after short circuiting through this Endless Engine door and, dilute all gases north-west of the Endless rise gallery. But the

\*Not printed.

extent and violence of the explosion in that area are against any such presumption. Gas must have been in an explosive limit, say about 9.5 per cent. or 10 per cent., to cause such a devastating explosion.

9. It cannot be reconciled that on the other days, the endless haulage door was carefully closed and opened for loaders and others to pass, by any special attendant. Even if it is assumed that a door attendant was engaged, the matter would not have improved very much.

10. According to Bande Ali Mian, loading of 15-16 tubs from the rise section was in progress when he had left with a set of 14-15 tubs worked by the Endless Haulage. He could not have taken a long time to reach the spot where he experienced the air-blast and fell down. This also proves that there was no heavy accumulation of gas in that rise section when workers were coming and going through the door only a few minutes ago. Had there been any heavy accumulation of gas, the safety lamps could not have been burning to allow workers to move about for loading coal.

11. It is noteworthy that with the exception of 6 miners all workmen of the rise section of that shift were on the Main South Level at the time of the explosion. It seems that all the safety lamps got fairly simultaneously extinguished by an influx of inflammable gas. I am of the view that the inflammable gas was pushed out of the stowed area by a roof fall inside the goaf.

12. Now, it has been contended that the goaf was packed hydraulically with sand and therefore no roof fall could occur there which would be responsible for pushing out gas. This, is however, not borne out by the following:—

- (1) Sri S. G. Ghosh, (C.W. 7), deposed that he saw a gap between the sand and the roof and it was about a foot and a half or two.
- (2) Sri N. K. Chatterjee, (M.W.7), also deposed that there was a gap between the roof and sand.
- (3) During the Court's visit on 4th March 1955, I had also personally noticed the gap between the sand and roof.
- (4) Mines Inspectors' reports from time to time also show that stowing was not satisfactorily done in Amlabad Colliery.
- (a) Sri A. C. Bose, Assistant Chief Inspector of Mines (D.W. No. 2), deposed:—

“A part of the goaf area was not stowed.”

“I found that stowing of the south district goaf was not in order.”

This goaf area, according to him, was about 500 ft. in by from the present goaf edge. He inspected this area on 27th and 28th May, 1954.

- (b) In the report of inspections made on the 30th and 31st August, 1950, Messrs. H. B. Ghosh and G. S. Marwaha, the following passage is found:—

18 Seam: A more systematic line of face in the depillaring area should be brought about. This can only be done by mere intensive stowing of the goaves. There are large areas of unstowed goaves in this district. For a period of last 9 weeks, about 7,500 tons of coal has been raised and about 5,500 tons of sand has been put in this district, whereas the usual ratio of coal raised and sand stowed should be about 1:4 by weight.

- (c) Mr. G. S. Marwaha's (Ext. C-52), report of inspections made on the 30th June, 1953 and 2nd July 1953 states:—

18 Seam: “Travelled up the main haulage dip and back down the cross-cut to inspect two splits being driven in 11 E level. Two small voids about 40' × 40' size were awaiting stowing.”

Page 5: “A statement detailing the tonnages of sand stowed and the tonnage of coal raised from depillaring during

- (i) every day of June 1953 and,

- (ii) every month from July 1952 to June 1953, is attached. From these statements it will be seen that even excluding very bad stowing periods, the ratio of sand stowed to coal raised (from depillaring alone) varies from 1:04 to 1:4 by weight. The size of pillars in the workings varies from 75 ft. centres to 100 ft. centres. The galleries are 14 to 16 ft. wide on the average. The coal left in pillars in first extraction, therefore, amounted to 62 to 74 per cent.

Assuming 24 cft. of sand and 36 cft. of solid coal to ton, the sand coal ratio should be of the order of 2.42: 1 to 2.0 1:1 by weight.

It will be seen, therefore, that much more sand is to be stowed for the coal at present raised. The Manager stated that though a second pipe-range had been fitted in the shafts, it would not be of much use till after the rains due to non-availability of sand at the surface.

The management may be advised to take steps to ensure that the sand: coal ratio in depillaring areas does not go below 2:1.

Sand stowed in tons etc.

Months	Sand stowed (in Tons)	Coal raised from depillaring areas (in Tons)	Remarks sand : coal ratio.
July, 1952	12767	10201	1.25
August, 1952	13147	9682	1.36 (stowing is less due to breakdown in the stowing range)
September, 1952	10630	9923	1.07
October, 1952	5687	11177	0.51
November, 1952	9426	12082	0.735
December, 1952	14327	13769	1.04
January, 1953	11386	11555	0.985
February, 1953	14933.5	13196	1.14
March, 1953	17244.5	12282	1.40
April, 1953	9232	11494	0.78
May, 1953	15126.5	11137	1.36
June, 1953	13767	10959	1.26 Stowing is less due to breakdown in the stowing range and for the sand line being out of order.)

(d) Report of inspections made by Sri S. N. Ramanathan, Junior Inspector of Mines (Ext. C-49), on 1, 2, 3 and 4th December, 1947 reads:—

"Local falls were noticeable in a number of 'voids' which were left unstowed."

"Coal recovered to sand stowed in the west and south districts in 18 seam the ratio is rather low (0.68 to 0.23). This appeared to be due to breakdown of the pumps in the East district and the Pit bottom, as a result of which less sand was flushed into the workings."

(e) Report of inspections made by Mr. G. S. Marwaha on 26th and 28th November, 1952 (Ext. C-54)\* runs as follows:—

"No. 1 East Level Section—Here a fault had been met on the east side and a hand-driven bore-hole had been put to meet the seam on the other side of the fault, as soon as coal had been touched in the hole, large quantities of inflammable gas had started blowing out. A 1200 cft. air-blower fan had been put to dilute the gas and to take it directly into the main return airway. Besides all work in the district had been stopped from that day. Tested for gas at the mouth of the bore-hole: Some inflammable gas was still coming out."

"Reg. 78(i): Sand packing was not keeping pace with pillar extraction with the result that several voids were awaiting stowing. This is a long standing defect in the working of this mine and calls for a concentrated effort by the management for its eradication."



13. The above citations are enough to indicate that this colliery had never been stowing in a satisfactory manner and, also was in the habit of leaving voids in the goaf. Roof fall can and must, therefore, occur inside the goaf pushing inflammable gas out whenever present therein.

14. The first reported information by the colliery to the Superintendent, Rescue Station, Jharia, as also to the Chief Inspector of Mines in India, on telephone was about a probable roof fall underground. The stoppage of rescue work between 0.30 and 10 hours on the 6th February, 1955, coupled with the statements of Messrs. Ramanathan and Lawrence to Mr. Jabni, that they heard three reports on the dip side of the 60 H.P. haulage brow, as if some fall had taken place, are further pointers to the goaves having not been properly stowed, which resulted in inevitable roof falls.

The partial derangement of ventilation, in the ordinary course of gas exudation, would only increase the percentage of gas to about 3 per cent. in the general body of the air between the endless haulage line and the goaf edges during the period the door would have been kept open, but as soon as that junction point was getting the short-circuited air passing through the door, the gas if any therein would get diluted to undetectable quantity and pass through the remaining part of the Rise Section in the usual manner.

15. Now, assuming that the ventilation got partially deranged as a result of opening the door on the 5th February, 1955, there is no reason to believe that on other days it was not similarly affected. There was no regular door attendant on the colliery establishment. It cannot, therefore, be assumed that on other days the door attendant was provided. Even if a door attendant was provided and assuming that about 30 tubs were being raised from that area, for loading alone, taking 22 baskets for a tub, the door would have to be closed and also opened for going and coming about 660 times for coal loading alone, with other persons utilising this door at the same time, it may be required to be opened about 800 times within a short span of about 2 hours. This presumably had been done usually after about 1 o'clock and, probably between 1 and 3 P.M., when the coal would have been completed, as was the case on the 5th February, 1955. It is questionable whether there was much difference between this process of closing and opening the door for 800 times on other days and keeping it open for the whole 2 hours between 1 and 3 P.M. on 5th February, 1955.

16. Non-existence of gas in a heavy quantity on previous days in the rise section, when the condition of work could not have been much better than what existed on the 5th February, 1955 pointedly prove that it was not the normal increase in gas due to any short-circuiting of air that the heavy accumulation of gas occurred, but it was due to accumulated gas in the goaf area which was suddenly pushed by a roof fall therein. The extent of explosion on the north-west side of the haulage rise conclusively proves that there was accumulation of inflammable gas in highly explosive mixture in that area. It can safely be said that the whole quantity of 6960 cft. of air, which was passing that way, even when the door was open, could not allow an accumulation of gas if the supply of the same from the goaf edges was normal.

17. There is no record of presence of any detectable quantity of inflammable gas in the affected area on the days prior to 5th February, 1955. We may assume that this was because the gas that was normally coming out from the goaf edge was getting diluted to about  $1\frac{1}{2}$  per cent. may be even less, and it was not detectable in a flame safety lamp. Taking the normal, total quantity of air passing to be 6960 (say 7,000 cft.), when the door was closed, the normal exudation of gas from the goaf edge could not exceed about 100 cft. per minute. In other words, if 100 cft. of pure gas were mixed with 7,000 cft. of air, the mixture would represent about  $1\frac{1}{2}$  per cent. of gas in the general body of the air passing through the Rise Section, which was not detectable in a flame safety lamp.

18. I cannot but come to the conclusion that accumulation of heavy quantity of gas could have only taken place as a result of sudden on-rush of gas from inside the void in the goaf area. It was improbable that gas, under its normal liberation from the goaf edges, could envelope practically the whole of the Rise Endless Section through the same quantity of air which passed on previous days, was passing on 5th February 1955, as well. In my opinion, the quantity of air passing through the Rise Section was adequate. It was also in conformity with the legislation of various states of the U.S.A. There was no accumulation of gas on the previous days when the conditions of work remained practically the same. While the constant opening of the door at the 10 H.P. Endless Haulage on 5th February, 1955, would reduce the quantity of air passing through the goaf edge and up to the Endless Haulage Rise Gallery behind the door, it could not be instrumental in causing accumulation of gas to such a great extent.

19. On the above basis it would be seen that even if the quantity of air passing through the goaf edges was reduced to 50 per cent. which was held to be the quantity of air travelling when the door was open, the percentage of gas in the level gallery up to the junction of the Endless Rise Gallery should not have exceeded 3. But it had been proved beyond doubt that the percentage of gas at W-1\* in plan Ext. M-1\* was in the region of 10, as otherwise it could not have been the seat of explosion. The gas at the point of junction on the Endless Haulage Rise Gallery, where the two air currents met and beyond, would surely get diluted if the supply of gas was normal. Any increase on the normal exudation of gas was, therefore, to be regarded as due to abnormal conditions, that is, due to roof fall in the goaf area in the present case.

20. Taking that about 10 per cent. of inflammable gas was present at W-1, the seat of explosion, the accumulation of gas between the Endless Rise Gallery and the goaf edges must have been about 20 percent or even more. The above position would not have been created if the exudation of gas from the goaf edge continued to be normal, that is, about 100 cft. per minute. It cannot, therefore, be affirmed that ventilation was responsible for the accumulation of gas such as would cause an explosion.

21. *Cause of the Ignition/Explosion.*—One or more of the following causes are usually attributed to a gas ignition:

- (a) underground fire;
- (b) Shot firing;
- (c) Sparks produced from coal cutting;
- (d) Naked flame;
- (e) Frictional spark from heated surface;
- (f) Safety lamps, and
- (g) Spark from an electric apparatus.

(a) *Underground fire.*—I agree with paragraph 39 of the Report that underground fire did not cause ignition. Inasmuch as there was no fire present underground either before or after the explosion.

(b) *Shot firing.*—Shyamapada Bhowmik (Management witness No. 5), stated that he was the only shot-firer in that Rise Section and, that he had fired ten shots only in the working place marked W-1 on plan\* Ext. M-1 on that day. He also stated that there was no more shots to be fired during that shift. Now in Plan M-1\* there are shown, "hole packed with detonator", "holes on roof" etc. Either, these were not within the knowledge of Bhowmik or there were others, probably miners, who did shotfiring as well. Particularly, "hole packed with detonator" clearly presupposes that some one had packed it but for some reason or other could not fire the shot. That shots were also fired by other than only one authorised shot-firer is apparent from the fact that more than 10 shots were required to blast about 25 tons of coal in a shift. This is on the assumption that about 30 tubs were loaded in the morning shift. This again is based on the number of miners (13) working on the 5th February, 1955, and the magnitude of progress made in this particular Section. the total coal brought from the gallery marked "L" on plan\* Ext. M-1 alone would amount to about 700 tons, taking the size of the gallery to be about 165 ft. long, 12 feet wide, and 10 feet in height. In addition to this, there are other working places, viz., roof and sides of galleries and drivage of at least two more galleries. Assuming that another about 700 tons of coal had been mined up to 5th February, 1955, from these places, the total coal obtained from this Rise Section would amount to 1,400 tons approximately. This is a conservative estimate.

Taking 24 working days, daily output must have been 60 tons approximately. If the work was carried on in three shifts 20 tons must have been raised on an average per shift. But it has been seen in the mining practice that about 40/45 per cent. of the day's total output comes out from a mine in the morning shift, as always more workers come for work in the morning shift. Taking that about 25 tons were cut and raised in the morning shift, certainly much more shot-holes than ten would be required if all coal was mined by blasting. And there is no proof of hand cutting of coal in this section without the assistance of blasting. No coal cutting machine was also used in this section. Though, more shots than 10 must have been fired, probably by some other person than Bhowmik, in that morning shift, to allow 30 tubs to be loaded (15 were already loaded and drawn

out by Bande Ali Mian and, 15 were being loaded), there was no evidence available to connect shot-firing with the cause of ignition/explosion. Shot-firing as a source of ignition is thus being not considered.

(c) *Sparks produced from coal cutting.*—There was no evidence of any spark from coal cutting igniting the gas.

(d) *Naked flame.*—I agree with paragraph 42 of the main Report. This cause may be eliminated.

(e) *Frictional spark produced from heated surface.*—I agree with paragraph 43 of the main Report. This cause may also be eliminated, as in my opinion, the percentage of gas between the goaf edge and the Endless Rise Gallery was much beyond explosive limit and possibly not even within the range of ignition.

(f) *Safety lamps.*—52 persons, who are dead, should have had 52 safety lamps. 50 safety lamps have been recovered and examined by Court of Inquiry but no defect was found in any one of them. Two lamps still stand unaccounted for.

4 persons belonging to other collieries who worked in different Rescue Teams, soon after the explosion, were examined as Court witnesses. Three of them deposed that they had seen the top portion of a safety lamp without the oil-can attached to it and, another one said that he had seen both the top and bottom portions of the safety lamp lying at different places. All these four witnesses, indicated the same spot underground where the top portion was seen by each of them, but for various other shortcomings in their evidence, the same was thought to be not dependable.

(g) *Spark from Electric apparatus.*—I do not agree with the major portion of what has been said in different paragraphs of the Report relating to the spark from electric apparatus. Although it may be contended that the 60 H.P. non-flame proof Haulage gear was liable to sparking, it was established that no evidence of open spark, which could be attributed to the cause of ignition, was found in the motor or its ancillaries. Probabilities of open sparks were only mentioned by different witnesses including Mr. Welsh, but no one could firmly assert that there was any such spark from any part of the apparatus. That the motor was not running when the ignition took place will also be evident from the following:

(i) The controller was in the "off" position and, the engine driver was about 60 feet away from the controller of the motor. It cannot be reconciled that the driver ran away from the place as soon as the spark with the controller moving to the "off" position ignited the gas.

(ii) The rope capel was detached from the set of tubs and, lying on the side of the gallery. The man who had detached the rope capel must have done so from the side on which the rope capel was lying. But we find no one on that side of the tubs excepting the dead body of the Haulage Engine driver.

The men who opened the capel could not have inserted the sprag into the tub wheel on the other side of the tub for breaking the momentum of the set of the tubs. It must have been done before the set of tubs came to rest and evidently not by the person who had opened the capel, but by someone else. Kalipada Rajowar and Jagree Rajowar (serial Nos. 24 and 25 of the plan\* No. D.M.I. No. 12-55, showing the position of the dead bodies), are trammers who probably performed both these operations. Their dead bodies were found more than 60 feet away from the main dip haulage brow, towards the Endless Haulage line. It is likely that they had gone there to make room for the new loaded set of tubs to pass on to the Endless Haulage for forward journey to the pit bottom. From a scrutiny of the plan\* (Ext. M-1) it will be seen that further travel of the loaded tubs brought by the main dip 60 H.P. Haulage was blocked by other tubs in front of them.

The front two tubs of the set were also found in a derailed position. This might have been due to the sprag having been inserted late or may be that they had been derailed by the force of explosion. The way they were found derailed did not, however, indicate that the derailment was caused by the force of explosion.

(iii) In the case of the set of tubs hauled by the 60 H.P. Haulage engine to the need of the brow, sprag would normally be inserted, to bring the set of tubs to a standstill position, soon after the stoppage of the motor. Supply of electric energy would be normally cut off as soon as the last tub in the set would have crossed the stop block or the top most part of the brow.

\* Not printed.

Now, the tram line at the landing place has a gradient towards the Haulage engine. The controller of the motor for this also must have been cut off before the sprag was inserted. The rope capel must be uncoupled only after the insertion of the sprag, as both these operations were to be performed after the controller was brought to the "off" position, it is incomprehensible that the trammers would still care to insert the sprag first, uncouple the rope thereafter, while the ignition of gas would be scaring them, and then only run for their lives therefrom.

(iv) 60 H.P. Haulage Engine was being ventilated by intake air passing through a hole in the stopping at the back of the engine. The intake air pressure at that hole being more than the pressure of the return air which was flowing on the other side of the hole, it (return air) could not enter the intake air-way through the same hole and fill up the engine room with inflammable gas. The contention that the diffusion would take place according to Graham's Law is not maintainable due to difference in pressure between the intake and return air-ways and constant flow of both the air currents. This rules out the possibility of accumulation of gas in the engine room. Furthermore, the percentage of gas between the Endless Haulage Rise Gallery and the nearest goaf edge could not have been less than, probably 20 per cent. maybe that it was even more than 20 per cent, rules out all the possibility of any ignition originating from the 60 H.P. Haulage Engine.

(v) There must have been a safety lamp belonging to the Haulage Engine driver. The normal place from which it was hung was a hook in the roof. Although it cannot be said whether the safety lamp at that particular moment was hanging from the roof or not, wherever it was, it must have got extinguished if there was any gas in sufficient quantity capable of being ignited. The Haulage Engine driver would have got sufficient warning of the presence of gas from the extinction of the lamp and would surely with the extinguishment thereof cut off electrical energy from the Haulage Engine.

(vi) If the engine room was filled up with gas, the inside of the motor would have also been filled up with the same. Ignition originating from either the motor or other accessories would leave marks of burning of the insulation in them. But no indication of such ignition could be traced. Evidence of violence from external source is manifested in various parts of the equipment. This conclusively proves that the engine room had no gas when the force of explosion travelled there and that all the damage caused to the equipment was due to external force acting on it.

(vii) Mr. Welsh has said—

"The motor must have been running for some time prior to the explosion with the brushes touching, as the brush was worn to the shape of the slip-ring. The brush-holder which was lying in a bent position should have been brought back to its original position in order to run the motor correctly."

Now, if the two brushes in a three phase motor touch each other, the resistance between these two brushes would be shorted and the starting current would increase and get unbalanced and thereby trip the circuit breaker. In my opinion, the brush-holders were brought together by the cover which was found badly dented by the force of the explosion.

From a scrutiny of the above, it would be seen that the contention that 60 H.P. non-flame proof motor might have been responsible to ignite the gas is far from a possibility.

22. *Seat of Explosion.*—It is well-known that less violence is seen at the seat of explosion. This is because the force of explosion radiates in all directions from its place of origin, in the case of the Amlabad Explosion, the place wherefrom the explosion originated can be clearly identified. It is the place marked W-1 in plan\* Ext. M-1. It was the less disturbed spot in the "affected area" and signs of radiation of violence in all directions existed around this spot.

23. The intensity of the force of explosion also points to small amount of coal dust having played a part with the inflammable gas. The maximum force of explosion had travelled towards west through the gallery marked I, Ext. M-1 lying parallel to the gallery marked II in the same plan\*. This is based on the

fact that it was in this gallery where it met the main south Level, the stowing pipe range had been torn asunder. The pipe had a round surface with less area against the violence of explosion, but yet it had been broken and thrown out of position. That great force acted against the small round surface of the pipe, is clearly evident from this fact. Violence of the explosion had also been manifested towards the return side, west of gallery marked II (Ext. M-I) and the Endless gallery, but it was not so much violent towards the goaf edge. This was due presumably to concentration of gas beyond upper explosive limit and non-existence of sufficient coal dust in that area. The damage to the 60 H.P. N.F.L.P. motor and its ancillaries has been comparatively much less than the 10 H.P. Endless motor and its equipment. This fact also corroborates that the magnitude of violence was much less on this side.

24. *Seat of Ignition.*—It has not been difficult to locate the seat of Explosion, but it has not been possible to fix the Seat of Ignition or the cause of it. It is certain, however, that the Seat of Ignition was within the Endless Haulage Rise Gallery or close to it and not far from the Seat of Explosion. It may be that the Seat of explosion was also the Seat of Ignition. The suggestion by different parties that the ignition of gas originated from a spot between the Endless Rise Gallery and the goaf edge, is not tenable due to concentration of gas beyond the upper limit of ignition in that area. It cannot be reconciled that there was less percentage of gas in this area and more within the Endless Rise Gallery and beyond toward the return, through which all the air, leaking through the Endless Haulage door and coming from the goaf edge side, was passing.

25. From the various probable causes of ignition, as discussed above, I am sorry, it has not been possible to arrive at a firm conclusion as to the cause of the ignition/explosion.

#### GENERAL REMARKS

26. Shri A. C. Basu (D.W. 2) inspected Amlabad Colliery on 27th May and 28th May '54, about 8 months before the explosion. In his deposition he stated that during the time of his inspection the goaf in question was about 500 ft. away from the present goaf-edge. As the 60 H.P. electric haulage was still about 80 ft. away from the present goaf-edge it may be taken that the same was about 580 ft. away from the place of depillaring when Shri Basu inspected the mine. Shri P. C. Sarkar (C.W. No. 3), inspected the same area over six years ago, and Shri N. P. Ghosh, Junior Electric Inspector of Mines (C.W. No. 4), about 3 years prior to the date of explosion. The distance between the 60 H.P. endless haulage and the then place of depillaring must have been much more than 580 ft. at the time of each of these inspections which might call for any special examination for nearness of any goaf. More frequent inspections, however, by the Mines Inspectorate and also by the Electric Inspectorate of gassy mines is essential in the interest of safety.

Electricity rule No. 111 does not prohibit the installation of any electrical apparatus where gas is not likely to be normally present. No special permission from the Electric Inspector is required to install any non-flame proof electric apparatus under this Rule in an intake airway. This is presumably on the logic that an intake airway is not likely to have an accumulation of inflammable gas in a quantity sufficient to be indicative of danger. In the interest of greater safety, it is desirable that in gassy mines only flame-proof electrical apparatus be installed.

27. It appears that there does not exist co-ordination between the Mines Inspectorate and the Electric Inspectorate. The Chief Inspector of Mines, vide his circular No. 14192-96-g, dated 22nd November 1946, instructed the Deputy Chief Inspector of Mines and all Circle Inspectors to post the Electrical Inspector of Mines periodically with a statement of gassy mines, situations where inflammable gas is met with under ground *vis-a-vis* electric installation in such mines etc. etc. No action appears to have been taken on this circular by the Mines Inspectorate nor, has the Electric Inspector ever drawn attention of the Mines Inspectorate to the same. Better co-ordination between the Mines Inspectorate and the Electric Inspectorate for mines is desirable in the interest of safety.

(Sd.) M. L. SHOME,  
Chief Mining Engineer & Member-Secretary,  
Coal Board, and Assessor to the Court of  
Enquiry relating to Amlabad Mine Disaster.

*New Delhi, the 10th December 1955*

**S.R.O. 3689.(MA/2/1).**—In exercise of the powers conferred by clause (vi) of section 2(j) of the Mines Act, 1952 (XXXV of 1952) the Central Government hereby exempts all mica factories which are not situated within the precincts of mines in the State of Rajasthan from the operation of the said Act.

[File No. M-41(30)55.]

P. D. COMMAR, Under Secy.

## MINISTRY OF INFORMATION AND BROADCASTING

### ORDERS

*New Delhi-2, the 7th December 1955*

**S.R.O. 3690.**—In exercise of the powers conferred by section 17 of the Cinematograph Act, 1952 (XXXVII of 1952), and in supersession of the notification of the Government of India in the Ministry of Information and Broadcasting No. S.R.O. 361 dated the 8th February, 1955, the Central Government hereby exempts cinematograph exhibition of films in the premises of recognised educational institutions in all Part 'C' States from the operation of section 10 of the aforesaid Act, subject to the following conditions, namely:—

1. Only films of a predominantly educational nature, certified as such by the Central Board of Film Censors or one of the former State Boards or films approved as scientific films, films intended for educational purposes, films dealing with news and current events, or documentary films approved by the Film Advisory Board shall be exhibited or permitted to be exhibited.
2. No admission fee, except to the extent required to cover expenses, shall be charged.
3. No person other than students and staff of the Institutions, Members of the Managing Committees of the Institutions and any guests specially invited by the authorities or the Institutions and those enumerated under condition (8) below shall be admitted to the show.
4. Only non-inflammable films and film strips shall be exhibited or permitted to be exhibited.
5. No advertisement films shall be exhibited or permitted to be exhibited.
6. All Institutions which avail themselves of this exemption shall maintain a register of the films exhibited and comply with any other directions that may be issued in this behalf by the State Government. The register shall be open to inspection by duly authorised officers of the State Government.
7. This exemption shall be valid for a period of one year with effect from the date of issue of this notification, unless revoked earlier.
8. Employees of the State Government, members of the Central Board of Film Censors and its Advisory Panels and Regional and Assistant Regional Officers of the Board engaged in the discharge of their official duties shall be admitted to the place where the exhibitions are held and to the film shows.

[No. 6/6/55-FC.]

*New Delhi-2 the 12th December 1955*

**S.R.O. 3691.**—The Central Government hereby:—

- (a) directs, in pursuance of the provisions of the Order of the Government of India in the Ministry of Information and Broadcasting No. S.R.O. 781, dated the 1st March 1954 that the Advisory Panel of the Central Board of Film Censors at Madras shall consist of 22 members with effect from the 17th December, 1955; and

- (b) appoints, after the consultation with the said Board, the following persons as members of the Advisory Panel at Madras with effect from the 17th December, 1955:—

1. Shrimati Kasturi Rukmini.
2. Shrimati Laxmibai N. Lokur.
3. Dr. K. K. Raja.
4. Shri C. Raghunathan.
5. Shri K. Chakravarti.
6. Shri P. Markandeyulu.

[No. 14/5/55-FC.]

*New Delhi-2, the 15th December 1955*

**S.R.O. 3692**.—In pursuance of the clause 2 of the directions issued under the provisions of each of the enactments specified in the First schedule to the Order of the Government of India in the Ministry of Information and Broadcasting No. S.R.O. 945 dated the 28th April, 1955 the Central Government with previous approval of the Film Advisory Board, Bombay hereby certifies the film specified in column 2 of the schedule hereto annexed, in all its language versions, to be of the description specified against it in the corresponding entry of column 5 of the said schedule.

**SCHEDULE**

S. No.	Title of the film.	Name of the Producer.	Source of Supply.	Whether a Scientific film or a film intended for educational purposes or a film dealing with news and current events or a documentary film.
1	2	3	4	5
Indian News Review No. 374	Government of India, Films Division, Bombay.	Government of India, Films Division, Bombay.		Film dealing with news and current events.

[No. 1/16/55-F:App/62.]

D. KRISHNA AYYAR, Under Secy.

